

Nos. 2014-1690, -1164

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**UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT**

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SYNTRIX BIOSYSTEMS, INC.,

*Plaintiff-Cross Appellant,*

v.

ILLUMINA, INC.,

*Defendant-Appellant.*

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Appeals from the U.S. District Court for the Western District of Washington  
in case no. 10-CV-05870-BHS, Judge Benjamin H. Settle.

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**BRIEF FOR PLAINTIFF-CROSS APPELLANT  
SYNTRIX BIOSYSTEMS, INC.**

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April 24, 2014

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## **CERTIFICATE OF INTEREST**

Counsel for Plaintiff-Cross Appellant Syntrix Biosystems, Inc. certifies the following:

1. The full name of every party or amicus represented in this appeal is:  
Syntrix Biosystems, Inc.
2. The names of the real parties in interest represented in this appeal are:  
Not applicable.
3. The names of all parent corporations and any publicly held companies that own 10 percent of the party represented are:  
None.
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## TABLE OF CONTENTS

	Page
CERTIFICATE OF INTEREST .....	i
TABLE OF AUTHORITIES.....	vii
STATEMENT OF RELATED CASES.....	1
INTRODUCTION .....	2
STATEMENT OF ISSUES .....	5
STATEMENT OF THE CASE .....	7
STATEMENT OF FACTS.....	7
I.     Syntrix.....	7
II.    Syntrix's '682 Patent .....	8
III.   Illumina's Infringement.....	11
A.    Syntrix Disclosed Its Invention To Illumina Under A Nondisclosure Agreement.....	11
B.    Illumina Copied Syntrix's Invention.....	11
C.    Illumina Rebuffed Syntrix's Licensing Offers.....	13
D.    Illumina Initiated A Reexamination That Confirmed All Challenged Claims.....	14
E.    Illumina's Continued Infringement.....	14
IV.    District Court Proceedings.....	15
A.    State Law Claims.....	15
B.    Claim Construction.....	15
C.    Trial .....	15
D.    Damages .....	16

E. Post-Trial Motions.....	19
SUMMARY OF THE ARGUMENT .....	19
ARGUMENT .....	21
I. Standard Of Review.....	21
A. Written Description .....	21
B. Claim Construction.....	22
C. Admission Of Testimony Concerning Stock .....	23
D. Objective Prong Of Willfulness .....	23
II. The Judgment Of Infringement Should Be Affirmed. ....	23
A. Illumina Failed To Prove By Clear And Convincing Evidence That The '682 Patent Lacks Adequate Written Description. ....	23
1. The specification discloses particles larger than 2,000 angstroms. ....	25
2. Substantial evidence supports the jury's rejection of Illumina's trial theory. ....	28
3. Illumina's "class" argument is waived and not supported by the record.....	30
i. Illumina's "class" argument is waived. ....	30
ii. Illumina cites no evidence supporting its "class" argument.....	30
iii. Illumina's "class" argument is refuted by the language of the patent.....	31
iv. The written description is not limited to one purpose of the invention. ....	33
v. The written description is not limited to the embodiments.....	36

B. The Court Correctly Construed “Gelled Network of Particles.” .....	38
1. The specification defines “gelled network of particles” exactly as the district court construed it. ....	39
2. The patent does not support Illumina’s “multiple layers” construction.....	44
i. Illumina’s “multiple layers” construction has no support anywhere in the claims, specification, or file history.....	44
ii. Every authority cited by Illumina confirms that the district court was correct to construe “gelled network” according to the terms in the patent.....	47
iii. Illumina’s “multiple layers” construction improperly seeks to limit the claim to one purpose of the invention. ....	50
3. Illumina took a contrary position on “gelled network” when it submitted a third-party reexamination request. ....	52
4. At minimum, the district court’s reliance on expert testimony is entitled to deference. ....	53
5. The jury finding of adequate written description is supported by substantial evidence. ....	54
III. The Damages Award Should Be Affirmed. ....	56
A. The Stock Payment To Dr. Walt Was Admissible And Relevant To The Reasonable Royalty Rate. ....	57
B. The Jury’s Royalty Determination Is Supported By Extensive Independent Evidence. ....	63
IV. The District Court’s Willfulness Judgment Should Be Vacated. ....	65
A. The District Court Disregarded Overwhelming Evidence	

of Illumina's Objective Recklessness. ....	66
B. None Of Illumina's Asserted Defenses Was Reasonable. ....	70
C. The District Court Did Not Articulate Any Basis For Why Syntrix Failed to Meet The Objective Prong of <i>Seagate</i> . ....	73
<b>CONCLUSION.....</b>	<b>74</b>
<b>CERTIFICATE OF SERVICE</b>	
<b>CERTIFICATE OF COMPLIANCE</b>	

## TABLE OF AUTHORITIES

Page(s)

**CASES**

<i>Abbott Laboratories v. Syntron Bioresearch, Inc.</i> , 334 F.3d 1343 (Fed. Cir. 2003) .....	22, 27
<i>Absolute Software Inc. v. Stealth Signal Inc.</i> , 659 F.3d 1121 (Fed. Cir. 2011) .....	29
<i>ActiveVideo Networks, Inc. v. Verizon Communications Inc.</i> , 694 F.3d 1312 (Fed. Cir. 2012) .....	60
<i>Anascape, Ltd. v. Nintendo of America, Inc.</i> , 601 F.3d 1333 (Fed. Cir. 2010) .....	33, 38, 55, 56
<i>Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co.</i> , 598 F.3d 1336 (Fed. Cir. 2010) (en banc) .....	24, 25, 36
<i>Bard Peripheral Vascular, Inc. v. W.L. Gore &amp; Associates, Inc.</i> , 682 F.3d 1003 (Fed. Cir. 2012) .....	23, 65, 70
<i>Bayer CropScience AG v. Dow AgroSciences LLC</i> , 728 F.3d 1324 (Fed. Cir. 2013) .....	50
<i>Bose Corp. v. SDI Technologies, Inc.</i> , No. 2013-1347, 2014 WL 982765 (Fed. Cir. Mar. 14, 2014) (nonprecedential) .....	69
<i>Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.</i> , 334 F.3d 1294 (Fed. Cir. 2003) .....	51, 52
<i>Cordis Corp. v. Medtronic AVE, Inc.</i> , 339 F.3d 1352 (Fed. Cir. 2003) .....	54, 55
<i>E-Pass Technologies, Inc. v. 3Com Corp.</i> , 343 F.3d 1364 (Fed. Cir. 2003) .....	50, 52
<i>Energy Transportation Group, Inc. v. William Demant Holding A/S</i> , 697 F.3d 1342 (Fed. Cir. 2012) .....	63

<i>Estate of Barabin v. AstenJohnson, Inc.,</i> 740 F.3d 457 (9th Cir. 2014) .....	63
<i>Falko-Gunter Falkner v. Inglis,</i> 448 F.3d 1357 (Fed. Cir. 2006) .....	55
<i>Ferring B.V. v. Barr Laboratories, Inc.,</i> 437 F.3d 1181 (Fed. Cir. 2006) .....	62
<i>Fresenius USA, Inc. v. Baxter International, Inc.,</i> 582 F.3d 1288 (Fed. Cir. 2009) .....	30
<i>Gentry Gallery, Inc. v. Berkline Corp.,</i> 134 F.3d 1473 (Fed. Cir. 1998) .....	33, 55, 56
<i>Georgia-Pacific Corp. v. United States Plywood Corp.,</i> 318 F. Supp. 1116 (S.D.N.Y. 1970) .....	passim
<i>Harris v. United States</i> 371 F.2d 365 (9th Cir. 1967) .....	62
<i>Hologic, Inc. v. SenoRx, Inc.,</i> 639 F.3d 1329 (Fed. Cir. 2011) .....	49
<i>Howmedica Osteonics Corp. v. Wright Medical Technology, Inc.,</i> 540 F.3d 1337 (Fed. Cir. 2008) .....	50, 52
<i>Hynix Semiconductor Inc. v. Rambus Inc.,</i> 645 F.3d 1336 (Fed. Cir. 2011) .....	passim
<i>i4i Ltd. Partnership v. Microsoft Corp.,</i> 598 F.3d 831 (Fed. Cir. 2010) .....	passim
<i>ICU Medical, Inc. v. Alaris Medical Systems, Inc.,</i> 558 F.3d 1368 (Fed. Cir. 2009) .....	33
<i>In re Seagate Technology, LLC,</i> 497 F.3d 1360 (Fed. Cir. 2007) (en banc) .....	passim
<i>K-TEC, Inc. v. Vita-Mix Corp.,</i> 696 F.3d 1364 (Fed. Cir. 2012) .....	67, 68, 69, 70

<i>Kim v. ConAgra Foods, Inc.</i> , 465 F.3d 1312 (Fed. Cir. 2006) .....	51, 52
<i>Lampi Corp. v. American Power Products, Inc.</i> , 228 F.3d 1365 (Fed. Cir. 2000) .....	26, 29, 37
<i>LaserDynamics, Inc. v. Quanta Computer, Inc.</i> , 694 F.3d 51 (Fed. Cir. 2012) .....	65
<i>Liebel-Flarsheim Co. v. Medrad, Inc.</i> , 358 F.3d 898 (Fed. Cir. 2004) .....	51, 52
<i>LizardTech, Inc. v. Earth Resource Mapping, Inc.</i> , 424 F.3d 1336 (Fed. Cir. 2005) .....	33, 36, 49, 50, 55
<i>Lucent Technologies, Inc. v. Gateway, Inc.</i> , 580 F.3d 1301 (Fed. Cir. 2009) .....	passim
<i>Martek Biosciences Corp. v. Nutrinova, Inc.</i> , 579 F.3d 1363 (Fed. Cir. 2009) .....	21, 36, 37
<i>McGrath v. County of Nevada</i> , 67 F.3d 248 (9th Cir. 1995) .....	74
<i>Micro Chemical, Inc. v. Lextron, Inc.</i> , 317 F.3d 1387 (Fed. Cir. 2003) .....	60
<i>Moba, B.V. v. Diamond Automation, Inc.</i> , 325 F.3d 1306 (Fed. Cir. 2003) .....	54
<i>Northern Telecom Ltd. v. Samsung Electronics Co.</i> , 215 F.3d 1281 (Fed. Cir. 2000) .....	44, 45
<i>Northrop Grumman Corp. v. Intel Corp.</i> , 325 F.3d 1346 (Fed. Cir. 2003) .....	51, 52
<i>OSRAM Sylvania, Inc. v. American Induction Technologies, Inc.</i> , 701 F.3d 698 (Fed. Cir. 2012) .....	73, 74
<i>PharmaStem Therapeutics, Inc. v. ViaCell, Inc.</i> , 491 F.3d 1342 (Fed. Cir. 2007) .....	70, 71

<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005) .....	passim
<i>Praxair, Inc. v. ATMI, Inc.</i> , 543 F.3d 1306 (Fed. Cir. 2008) .....	50, 52
<i>Resonate Inc. v. Alteon Websystems, Inc.</i> , 338 F.3d 1360 (Fed. Cir. 2003) .....	51, 52
<i>ResQNet.com, Inc. v. Lansa, Inc.</i> , 594 F.3d 860 (Fed. Cir. 2010) .....	60, 61
<i>Retractable Technologies, Inc. v. Becton, Dickinson &amp; Co.</i> , 653 F.3d 1296 (Fed. Cir. 2011) .....	47, 48
<i>Safoco, Inc. v. Cameron International Corp.</i> , No. H-05-0739, 2009 WL 2424108 (S.D. Tex. July 31, 2009).....	67, 68
<i>Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.</i> , 723 F.3d 1363 (Fed. Cir. 2013), <i>cert. granted</i> , 2014 WL 199529 (Mar. 31, 2014) .....	passim
<i>Tronzo v. Biomet, Inc.</i> , 156 F.3d 1154 (Fed. Cir. 1998) .....	33, 38, 55, 56
<i>Uniloc USA, Inc. v. Microsoft Corp.</i> , 632 F.3d 1292 (Fed. Cir. 2011) .....	64, 65
<i>United States v. Hermanek</i> , 289 F.3d 1076 (9th Cir. 2002) .....	23
<i>United States v. Huang</i> , 87 F. App'x 656 (9th Cir. 2004) (nonprecedential).....	62
<i>United States v. Loyola-Dominguez</i> , 125 F.3d 1315 (9th Cir. 1997) .....	62
<i>United States v. Rahm</i> , 993 F.2d 1405 (9th Cir. 1993) .....	57
<i>United States v. Weiland</i> , 420 F.3d 1062 (9th Cir. 2005) .....	62

## STATUTES AND RULES

35 U.S.C.	
§ 282.....	21
§ 284.....	65
Fed. R. Civ. P. 52(a).....	22

## OTHER AUTHORITIES

<i>Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.</i> , No. 13-854, Petition for Writ of Certiorari, 2014 WL 230926 (U.S. Jan. 16, 2014) .....	22
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## STATEMENT OF RELATED CASES

There have been no prior appeals related to this case before any appellate court. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 723 F.3d 1363, 1373 (Fed. Cir. 2013), *cert. granted*, 2014 WL 199529 (Mar. 31, 2014), may affect this case. The Supreme Court granted certiorari to determine whether a district court's factual findings in support of its claim construction should be reviewed for clear error. Undersigned counsel are aware of no other case in any court that will directly affect or be directly affected by this Court's decision in the pending appeal.

## INTRODUCTION

Syntrix's founder, Dr. John Zebala, invented and patented a fundamental breakthrough in the fabrication of microarrays—small, inexpensive chips that run thousands of tests on substances such as DNA. Dr. Zebala overcame several vexing problems with prior art microarrays by inventing new ways to apply fabrication techniques previously used to make semiconductors. The patented microarrays contain thousands of “particles” (for example, silica beads) around which the tests occur. These particles are linked together in a “gelled network” that holds them in place during fabrication and use. The '682 patent teaches how to fabricate these novel microarrays.

Syntrix gave Illumina Dr. Zebala's unpublished patent application as part of a potential collaboration, subject to a nondisclosure agreement, in 2000. But Illumina chose not to work with Syntrix, and chose not to respect Syntrix's rights. Instead, Illumina copied the technology that Syntrix disclosed to it—going so far as to use the altered spelling “**Sentrix**” in the name of its infringing products—and reaped hundreds of millions of dollars.

When Syntrix confronted Illumina about its infringement and sought to negotiate a license agreement, Illumina first delayed and then refused. Illumina then initiated a reexamination, in which the Patent Office confirmed every challenged claim. Then, after an eleven-day trial, a jury found that Illumina

infringed Syntrix's '682 patent and rejected all of Illumina's validity challenges.

As the district court wrote:

Trial in this matter was mostly a battle of the experts. Both parties called highly qualified and highly accomplished individuals with extensive knowledge in the field of DNA microarrays. On the questions of fact before the Court, the jury sided with Syntrix's expert, Dr. Michael Metzker.

A34.

Illumina now seeks to set aside the jury's verdict, but it presents no basis to do so. Illumina's lead argument challenges the jury's written description verdict about the size of the "particles" disclosed in the patent. Illumina argues that the written description is limited to a "class" of "small particles." But the patent never defines the invention that way and instead discloses outright that particles may be "any of a variety of sizes."

Illumina's second argument is that the district court erred when it construed the claim term "gelled network" according to the express definition in the specification's glossary. Illumina again ignores the text of the specification, and instead proposes a new limitation requiring "multiple layers." Illumina cannot cite even a single instance in which the patent refers to its desired "multiple layers" limitation. Instead, Illumina relies on the incorrect theory that the patent has a single "purpose," which can be imposed as an additional limitation on every claim.

Illumina's final argument is that the jury's royalty determination should be vacated because the district court abused its discretion by admitting testimony about a stock grant that accompanied a license agreement that both parties' experts agreed was the correct starting point for a hypothetical negotiation for a reasonable royalty. But the testimony was relevant and admissible to show the amount that Illumina would willingly pay to license the '682 patent. And, even if it had been an abuse of discretion to admit evidence of the stock grant (which it was not), the error would be harmless because extensive independent evidence supports the jury's damages award.

At some point along the path to this litigation, Illumina's conduct crossed the line from infringement to willful infringement. Compelling evidence shows that Illumina crossed that line early, when it intentionally copied Syntrix's invention—and implicitly acknowledged that copying by mimicking Syntrix's name for its infringing "Sentrix" BeadChip products. At a minimum, Illumina's infringement became objectively reckless when the patent emerged from reexamination, and Illumina continued to infringe. Illumina was left with no reasonable defenses, because its written description and claim construction arguments are flatly inconsistent with the patent and rely on theories that this Court has expressly rejected. The district court therefore erred when it concluded

(without stating any reasoning) that Syntrix could not satisfy the objective prong of its willful infringement claim.

The judgment of infringement, no invalidity, and damages should be affirmed, and the judgment of no willfulness should be vacated and remanded for a trial on the subjective prong.

## **STATEMENT OF ISSUES**

1. Whether the jury's factual determination that Illumina failed to prove by clear and convincing evidence that the claim for a "gelled network of particles" lacks written description as to certain-sized particles should be affirmed where:

- a. the specification expressly discloses particles of "any" size;
- b. the written description argument that Illumina presented at trial and the jury rejected is directly contradicted by the specification and claims; and
- c. Illumina's new "large-size" class and "small-size" class argument is waived, factually inaccurate, and legally unsound.

2. Whether the district court's construction of the claimed "gelled network" should be affirmed where:

- a. the specification includes a glossary that defines "gelled network" exactly as the district court construed it;

b. Illumina's proposed construction seeks to impose a limitation of "multiple layers" that is never mentioned, even a single time, in the claims or specification;

c. Illumina's proposed construction seeks to limit the claim to a single purpose of the invention; and

d. the district court heard, and credited, expert testimony that one of ordinary skill in the art would interpret the claim as the court construed it.

3. Whether the jury's determination of a reasonable royalty should be affirmed where Illumina's sole argument for vacating that award is that the district court abused its discretion by allowing testimony about a stock grant where:

a. the stock grant was admissible and relevant to show what Illumina would have been willing to pay to license the '682 patent;

b. the stock grant was independently admissible to show bias of Illumina's witness; and,

c. even if admission of the stock grant were an abuse of discretion (which it was not), it was harmless because extensive independent evidence supports the jury's award.

4. (Cross-Appeal) Whether the district court erred by concluding, without analysis, that Syntrix did not satisfy the objective prong of the willfulness test where:

- a. compelling evidence shows that Illumina intentionally copied Syntrix's invention, going so far as to name its infringing product "Sentrix";
- b. Illumina repeatedly rebuffed and delayed Syntrix's efforts to negotiate a license agreement;
- c. Illumina continued to infringe even after the Patent Office rejected its anticipation argument during reexamination;
- d. all of Illumina's defenses—anticipation, written description, claim construction, and noninfringement—were not only incorrect but unreasonable.

## **STATEMENT OF THE CASE**

Syntrix sued Illumina for patent infringement in the United States District Court for the Western District of Washington. The judgment and orders of the district court are not published, but are included in the joint appendix.

## **STATEMENT OF FACTS**

### **I. SYNTRIX**

Syntrix Biosystems, Inc. ("Syntrix") is a biopharmaceutical company, founded by Dr. John Zebala, committed to discovering innovative therapies for patients in unmet markets. A10168; A10323. While he was a medical resident in the 1990s, Dr. Zebala began researching ways to develop a new diagnostic test for breast cancer. A10214. Dr. Zebala invented a way to use a technology from

semiconductor fabrication to distinguish cancerous cells from normal cells.

A10215-17. Dr. Zebala patented the invention and received the Paul E. Strandjord Young Investigator Award from the Academy of Clinical Pathologists and Laboratory Scientists. A10220-21.

Then Dr. Zebala realized that he could also use techniques from semiconductor fabrication to build a better microarray. A10221. Microarrays—small, inexpensive chips that run many simultaneous tests on substances such as DNA—are a crucial testing tool in modern laboratories; they are able to perform thousands of tests using an “array” of probe chemicals located on a single chip—much like a computer microchip contains thousands of circuits with different functions arranged close together. A10190; A10212; A10227-29. Dr. Zebala received a grant from the U.S. Army to develop this research, which led to the development of the innovative microarray platform that is at the heart of the ’682 patent. A10221.

## **II. SYNTRIX’S ’682 PATENT**

During the mid-1990s, microarray technology was “highly valuable” as many companies were “trying to find ways or alternative modifications to the existing [microarray] platform” created by Affymetrix, then the leader in the industry. A10236. Dr. Zebala sought to develop a new microarray platform that

would “have significant value and would allow me to go out and potentially jump start a company . . .” A10235.

At the time, microarrays typically involved probe chemicals (called “ligands”) located on top of structures such as glass slides (called “substrates”). A10169; A10225-26. This design had significant problems. Ligands on a smooth glass surface were not highly concentrated, so the signals they produced were hard to read—a problem known as low signal strength. A10282.

Second-generation microarrays included two new types of platforms: (i) gel pads and (ii) fiber-optic bundles. A20011-15. These strategies suffered from several disadvantages as well: gel pads restricted the size of the test molecules, would swell during testing, and were not compatible with a desirable fabrication technique (called “solid-phase chemical synthesis”). A20014; A68(1:59-60). Fiber-optic bundles were limited to small numbers of tests and were costly to fabricate. A20011-13; A10667.

The ’682 patent describes a novel microarray format to address these and other problems with first- and second-generation platforms.

*First*, the ’682 patent discloses a coating that can be manufactured using the same low-cost microfabrication techniques that the semiconductor industry uses to

manufacture computer chips. A10233.<sup>1</sup> **Second**, to ensure that particles do not swell or distort during fabrication or testing, the coating consists of a rigid, non-swelling “gelled network of particles.” A71(7:9-11); A86(37:61-65). **Third** and **fourth**, “[a]n important aspect of the present invention is the discovery that the porous coatings provide excellent supports for performing solid-phase chemical synthesis of ligands and detecting bound ligands . . .” A86(37:58-61). “Synthesis of ligands” refers to the fabrication process of placing the probe chemicals on the microarray. “Detecting bound ligands” refers to the reading of the testing results. The invention supports these two steps because the coating is porous, and so “is permanently open . . . on the surface of the substrate” and “accessible” by chemicals used in fabrication and testing. A86(37:64-67). **Fifth**, the porous coatings are uniform and continuous. A78(22:13-17); *cf.* A69(3:5-13). **Sixth**, the porous coatings can be applied over any surface, so the invention does not limit the capacity to support a large number of tests. A20015. Millions of unique tests can be performed on a single 1x3 inch slide. *Id.*; A10666-68. **Seventh**, the porous

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<sup>1</sup> These specific techniques—irradiation, photoresist, developers, strippers, and reagents—are disclosed in detail in the patent. A73(11:49-50). For example, the patent teaches that the coatings “may also be patterned using a photoresist and photolithographic methods in a fashion which allows exemplary reproducibility and control over the dimensional features of the patterned porous coating.” A78(22:17-21).

coatings increase the surface area for attaching probe chemicals (ligands), which increases signal strength. A78(22:29-32).

### **III. ILLUMINA'S INFRINGEMENT**

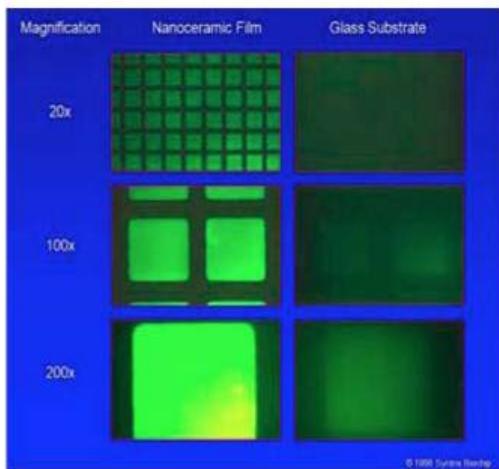
#### **A. Syntrix Disclosed Its Invention To Illumina Under A Nondisclosure Agreement.**

In 1999, Dr. Zebala began speaking with companies to discuss their potential interest in his microarray invention. In January 2000, Dr. Zebala approached Illumina and spoke with Dr. John Stuelpnagel, Illumina's co-founder and chief technology officer. A10337-38. Illumina and Syntrix executed a nondisclosure agreement, in which Illumina agreed not to use any of Syntrix's confidential information "for any purpose except to evaluate and engage in discussions concerning a potential business relationship" between Syntrix and Illumina. A1894. Dr. Zebala then gave Illumina the unpublished patent application that later led to the issuance of the '682 patent, as well as a multimedia presentation describing the technology disclosed in the patent application. A10340; A3253; A3345-70; A1125-294. After receiving this information, Dr. Stuelpnagel told Dr. Zebala that Illumina was "going in another direction." A10340.

#### **B. Illumina Copied Syntrix's Invention.**

On February 10, 2000—weeks after receiving Syntrix's confidential information—Illumina filed its own U.S. provisional patent application, No. 60/181,631 ("Dickinson application"). A2026-31. The application was only six

pages and provided little data. *Id.*; A10353. The data it did contain included figures and disclosures that closely resembled the confidential material that Dr. Zebala provided Illumina under the nondisclosure agreement. A10669-71. For example, Figure 1 of the Dickinson application disclosed a checkerboard pattern consisting of “a gelled network in a slide format.” A10670. This image and its description is similar to an image from Syntrix’s presentation “showing a checkerboard pattern of a porous coating with a compound attached.” *Id.*:



Slide from Syntrix’s Confidential Packet

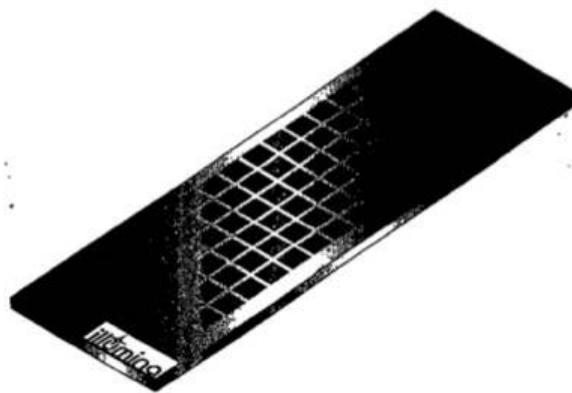


Figure 1 from Illumina’s Dickinson Provisional

A1761; A2031. The Dickinson application also disclosed a substrate consisting of the same materials described in the ’682 patent. A10670-71.

Then, in 2003, Illumina began marketing its microarray devices under the name “Sentrix”—almost identical to the “Syntrix” name. A10344; A10675. Illumina’s products included the “*Sentrix* Array Matrix” and the “*Sentrix* BeadChip”:



A5305. Illumina's trial witnesses gave three different, inconsistent stories about how they named their product "Sentrix."<sup>2</sup> Illumina's "Sentrix BeadChip" was the very product that incorporates the Syntrix invention claimed in the '682 patent.

### C. Illumina Rebuffed Syntrix's Licensing Offers.

The '682 patent issued in 2005. A58. The next year, Dr. Zebala received an e-mail from his former Ph.D. advisor, who informed him that Illumina's products

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<sup>2</sup> Compare A11003; A11011 (Steven Barnard testifying that Bahram Kermani came up with the name "Sentrix" and gave it to John Stuelpnagel) with A11111 (John Stuelpnagel testifying "that name was derived from marketing") and A11195 (Karen Possemato testifying that "Bahram [Kermani] came up with the name Gentrix" and a committee of Illumina executives changed the name to "Sentrix").

contained technology resembling the invention claimed in the '682 patent. A10341; A5188. Dr. Zebala visited Illumina's website and noticed that the BeadChip products were very similar to what he had developed and that Illumina was using the "Sentrax" name. A10344-46. In January 2007, counsel for Syntrix wrote to Illumina's general counsel, offering a license to the '682 patent. A3229; A11758. Illumina responded that it did not practice the patent. A3230. In August 2007, Syntrix provided Illumina a detailed claim chart explaining how Illumina's products infringed the '682 patent. A3230-36; A11758-59. Illumina again refused to license the patent.

**D. Illumina Initiated A Reexamination That Confirmed All Challenged Claims.**

In 2008, Illumina filed a third-party request for *ex parte* reexamination of the '682 patent. *See* A10348; A20326-420; A20425:4-13. In that reexamination, the Patent Office considered several prior art references, including two asserted by Illumina in support of its invalidity defenses in this litigation. A120. On June 29, 2010, the Patent Office confirmed the patentability of every challenged claim. A122.

**E. Illumina's Continued Infringement**

Despite knowing of the Patent Office's decision in 2010, A11759, Illumina continued to manufacture and sell its BeadChip products and made no effort to

design around the patent or take other corrective action. By 2012, Illumina had sold \$1.6 billion worth of accused products. A10878.

#### **IV. DISTRICT COURT PROCEEDINGS**

##### **A. State Law Claims**

On November 24, 2010, Syntrix sued Illumina, alleging infringement of the '682 patent, as well as state law misappropriation of trade secrets, breach of contract, and unjust enrichment. The district court held the state law claims time-barred and did not reach the merits on them. A204-08.

##### **B. Claim Construction**

One claim construction dispute is relevant on appeal. Illumina argued that the claimed “gelled network” “does not encompass a network that consist[s] of a monolayer of particles.” A20. The district court disagreed because “claim terms should not be limited to disclosed embodiments,” and “there is no clear indication that the patentee intended to encompass networks that included only two or more layers of particles.” A21. The court also rejected Illumina’s argument that Syntrix disavowed a monolayer embodiment during reexamination. *Id.* The district court adopted the definition of “gelled network” provided in the specification. A22.

##### **C. Trial**

After an eleven-day trial, the jury rejected all of Illumina’s challenges to the validity of every asserted claim, and found that every accused product infringed every asserted claim. A178-88. The jury did not have a chance to address

willfulness. Although the district court had originally indicated that it would not decide willfulness until “hearing testimony of witnesses and observing all of the other evidence at trial,” A199, it granted judgment as a matter of law against Syntrix on its willful infringement claim mid-trial, at the conclusion of Syntrix’s infringement case. A10811. The district court ruled before hearing any testimony from Illumina’s witnesses, including testimony regarding Illumina’s invalidity defenses. The district court did not provide any basis for its decision, either orally or in writing.

#### **D. Damages**

Each party offered a damages expert who testified regarding the reasonable royalty rate for the ’682 patent under *Georgia-Pacific*. A10841; A11449. Both experts agreed that a 1998 agreement between Tufts and Illumina was the proper starting point for determining the royalty rate. A10846-47; A11445-46. Syntrix’s expert, Alan Ratliff, explained that this “Tufts license” was “more than just a single agreement,” because it included a patent licensing agreement between Illumina and Tufts, and also related stock transfers between Illumina, Tufts, and Tufts professor David Walt (who was the primary inventor of the patents Illumina licensed). A10846-47. Tufts originally requested a 6% royalty from Illumina, but ultimately accepted a 3% royalty payment plus other consideration, including

stock, laboratory funding, and research and development money. A10847. In particular, Illumina transferred 30% of its stock to Tufts and Dr. Walt. A10847-49.

Mr. Ratliff also testified that universities are often willing to license technology “on reduced terms compared to what private entities might do.” A10825. A study conducted soon after the Tufts-Illumina license showed that, in the medical and life sciences fields, commercial licensors on average charged double the royalty rate that universities charged. A10851.

Mr. Ratliff then testified about other differences between the Tufts-Illumina license and the hypothetical Syntrix-Illumina license. While the Tufts-Illumina license and related agreements were negotiated in 1998, the hypothetical Syntrix-Illumina negotiation would have taken place in 2005. A10852. The known and projected value of Syntrix’s technology would have been higher in 2005 than in 1998 because of developments in the industry. A10852-53. While Illumina paid for the Tufts agreement with a combination of royalties, stock, and research fees, Illumina would have paid for the hypothetical Syntrix license entirely in royalties. A10853.

Mr. Ratliff also testified about Illumina’s license agreements with other companies; a study of microarray license agreements that had been conducted in a previous patent infringement suit against Illumina by Affymetrix showing royalties ranging from 10 to 15 percent; and the profitability of Illumina’s BeadChip

products. A10859-60. In addition, based on technical testimony from Syntrix's expert, Dr. Metzker, Mr. Ratliff explained that Syntrix's '682 patent conveyed significant advantages over other microarray technologies. A10861-63.

Mr. Ratliff also testified that, at the time of the hypothetical negotiation in 2005, Illumina projected an 85% gross margin on BeadChips, and a return on investment between 35% and 150%. A10864. Mr. Ratliff then explained to the jury that Illumina's earlier projections of BeadChip sales had proved accurate: sales of BeadChips almost completely replaced sales of the Sentrix Array Matrix within two years of the BeadChip's introduction, and sales of BeadChips also soon overtook and surpassed microarray sales by Illumina's main competitor. A10865-69. Furthermore, BeadChips sales drove demand for additional Illumina products that were designed to work with BeadChips. A10869-70.

Finally, Mr. Ratliff explained his calculation of a reasonable royalty rate of 6%. Mr. Ratliff used the 3% royalty rate from the 1998 Illumina-Tufts license agreement as a starting point, and opined that the royalty rate for the hypothetical license should be 6% for three independent reasons. *First*, microarray technology was more advanced in 2005 than in 1998. A10873. *Second*, Tufts is a university, whereas Syntrix would have been a commercial licensor. *Id.* *Third*, Illumina paid additional consideration on top of the 3% royalty; Tufts had originally requested a 6% royalty rate but ultimately accepted "3% plus stock and other considerations."

A10874. Mr. Ratliff also noted the rate he estimated—6%—was lower than the range for similar licenses in the industry as a whole. A10877.

#### **E. Post-Trial Motions**

After trial, Illumina brought a motion for judgment as a matter of law, asking the district court to reconsider its claim construction order and to overturn the jury’s infringement, invalidity, and damages findings. The district court denied Illumina’s motion. The court “decline[d] to . . . add certain limitations to the asserted claims of the patent.” A34. The district court also concluded that sufficient evidence supported the jury’s verdict. A34-41.

#### **SUMMARY OF THE ARGUMENT**

***Written Description:*** The Court should affirm the jury’s factual determination that Illumina failed to prove by clear and convincing evidence that the claim for a “gelled network of particles” lacks written description. The specification expressly discloses particles of “any of a variety of sizes” and teaches techniques for using “small” and “large” particles. Moreover, the jury heard, and credited, expert testimony that the patent provides sufficient written description to a person of ordinary skill in the art. Illumina has abandoned the written description argument that it presented at trial, in which it argued that claim 1 “doesn’t limit the particle size” at all. A11361. On appeal, Illumina presents a new, waived, and unfounded theory that the patent only “describes a specific *class* of small-particle

porous coatings” which is somehow distinct from the “large-particle structures” found in Illumina’s products. Br. 25. Illumina’s newfound distinction that the particles disclosed in the patent are in a separate “class” from Illumina’s infringing products finds no support anywhere in the ’682 patent or the evidence presented at trial. *Id.* To the contrary, the specification unequivocally states that particles may have “*any of a variety of sizes and shapes.*” A79. Illumina has not met its high burden of proof, and the written description judgment should be affirmed.

***Claim Construction:*** The specification includes a glossary that defines “gelled network” exactly as the district court construed it. In contrast, Illumina’s proposed construction seeks to impose a limitation of “multiple layers” that appears not once in the claims or specification. Illumina’s proposed construction seeks to limit the claim to a single purpose of the invention, contrary to this Court’s precedents. The district court heard, and credited, expert testimony that “one of ordinary skill in the art would interpret” the claim as the specification defines it, and as court construed it.

***Damages:*** The Court should affirm the jury’s determination of a reasonable royalty over Illumina’s abuse of discretion challenge. Illumina’s stock grant was admissible and relevant to show what Illumina would have been willing to pay to license the ’682 patent. Moreover, even if admission of the stock grant were an

abuse of discretion (which it was not), it was harmless because extensive independent evidence supports the jury’s award.

**Willfulness:** The district court erred by concluding, without analysis, that Syntrix did not satisfy the objective prong of the willfulness test. Compelling evidence shows that Illumina intentionally copied Syntrix’s invention, going so far as to name its infringing product “*Sentrix*. ” Illumina repeatedly rebuffed and delayed Syntrix’s efforts to negotiate a license agreement. Illumina continued to infringe the patent even after the Patent Office rejected its anticipation defenses during reexamination. All of the defenses Illumina presented at trial were unreasonable and were rejected by the jury. This Court should therefore vacate and remand the district court’s willfulness determination.

## **ARGUMENT**

### **I. STANDARD OF REVIEW**

#### **A. Written Description**

A patent is presumed valid, and the party asserting invalidity has the burden to prove its case by clear and convincing evidence. 35 U.S.C. § 282; *Hynix Semiconductor Inc. v. Rambus Inc.*, 645 F.3d 1336, 1351 (Fed. Cir. 2011). “Whether the written description requirement is met is a question of fact.” *Martek Biosciences Corp. v. Nutrinova, Inc.*, 579 F.3d 1363, 1369 (Fed. Cir. 2009). To reverse the jury’s factual finding, Illumina must establish that “no reasonable jury

could have decided that [Illumina] failed to prove by clear and convincing evidence that [asserted claim 1 is] invalid for failure to meet the written description requirement.” *Abbott Labs. v. Syntron Bioresearch, Inc.*, 334 F.3d 1343, 1357 (Fed. Cir. 2003); *accord Hynix*, 645 F.3d at 1352 (“review . . . on written description is severely circumscribed as a factual issue already decided by a jury and approved by the district court.”).

## B. Claim Construction

This Court’s precedent holds that claim construction is reviewed *de novo*. See *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 723 F.3d 1363, 1373 (Fed. Cir. 2013), *cert. granted*, 2014 WL 199529 (Mar. 31, 2014). The Supreme Court has granted certiorari to determine whether a district court’s factual findings in support of its construction should be reviewed only for clear error. See Petition for Writ of Certiorari, *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 2014 WL 230926 (Jan. 16, 2014) (No. 13-854); *see also id.*, at \*9 (seeking deference to district court findings of “what a person of ordinary skill in the art would have discerned from the patents”). The Supreme Court’s resolution of that issue is not necessary to this appeal because this Court can affirm the claim construction under *de novo* review. However, if this Court applying the *de novo* standard were to disagree with the district court, this Court should defer to the district court’s factual findings as Federal Rule of Civil Procedure 52(a) requires.

### **C. Admission Of Testimony Concerning Stock**

The district court’s “decision to admit or exclude expert testimony is reviewed for an abuse of discretion.” *United States v. Hermanek*, 289 F.3d 1076, 1092 (9th Cir. 2002). If the Court finds an abuse of discretion, the Court then determines whether the error was harmless. *Id.* at 1092-93; *see also id.* at 1096 (even “serious” error does not justify reversal when the error was harmless).

### **D. Objective Prong Of Willfulness**

Willful infringement requires “that the infringer acted despite an objectively high likelihood that its actions constituted infringement of a valid patent.” *In re Seagate Tech., LLC*, 497 F.3d 1360, 1371 (Fed. Cir. 2007) (en banc). This objective inquiry is reviewed *de novo*. *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assoc., Inc.*, 682 F.3d 1003, 1005 (Fed. Cir. 2012).

## **II. THE JUDGMENT OF INFRINGEMENT SHOULD BE AFFIRMED.**

### **A. Illumina Failed To Prove By Clear And Convincing Evidence That The ’682 Patent Lacks Adequate Written Description.**

Illumina’s written description argument hinges on its mistaken belief that there are somehow two “classes” of “particles”—what Illumina calls a “large-particle” class and what it calls a “small-particle” class. Br. 25. But in fact, the ’682 patent expressly rejects any distinction between a “large-particle” class and a

“small-particle” class, by disclosing unambiguously: “***Particles may have any of a variety of sizes and shapes.***” A79(24:52-53).<sup>3</sup>

The concept of two separate “classes” of particles—large and small—is wholly Illumina’s invention on appeal. To be sure, the specification does address certain particle sizes as preferable to others, and the patent includes dependent claims (which were not asserted) that add the limitation of a particle size below specific thresholds. *See A112-15* (Claims 5-8, 45, 75, and 93). But the specification’s disclosure that the particles of the invention “may have any of a variety of sizes and shapes” certainly “reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter”—the claimed porous coating using particles of any size and shape. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc).

Substantial evidence therefore supports the jury’s written description verdict for three reasons: (1) the specification expressly discloses particles of “any” size; (2) the written description argument that Illumina presented at trial and the jury rejected is directly contradicted by the specification and claims; and (3) Illumina’s new “large-size” class and “small-size” class argument is waived, factually inaccurate, and legally unsound.

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Emphases in this brief are added except where indicated.

**1. The specification discloses particles larger than 2,000 angstroms.**

Illumina bases its entire written description argument on its mistaken belief that “[t]he ’682 patent describes a specific class of small-particle porous coatings (with particles that are at most 2,000 angstroms).” Br. 25. In fact, the patent discloses that particles may have “*any* of a variety of sizes and shapes.” A79(24:52-53). The very sentence in the specification on which Illumina relies for its contention that the ’682 patent discloses only a “specific class of small-particle porous coatings” appears *after* the disclosure of “any” particle size, prefaced by the word “Preferably”:

Particles may have any of a variety of sizes and shapes. Preferably, the particles have a primary particle size of less than 2000 Å . . .

A79(24:52-54); *see* Br. 25-26. Taken together, these two sentences indicate that particles *may* be larger than 2,000 angstroms, though particle sizes of less than 2,000 angstroms are preferable. This disclosure “reasonably conveys to those skilled in the art that the inventor had possession” of the invention using *both* particles larger than 2,000 angstroms *and* particles smaller than 2,000 angstroms, and that the inventor had reasons to prefer the use of the smaller particles. *Ariad*, 598 F.3d at 1351. By ignoring the broader disclosure of “any” size particle and claiming that the disclosure only permits “particles that are at most 2,000 angstroms,” Illumina is improperly seeking to limit the written description

disclosure to a single preferred embodiment. *See, e.g., Lampi Corp. v. American Power Products, Inc.*, 228 F.3d 1365, 1378 (Fed. Cir. 2000) (rejecting attempt to limit written description to “only a preferred embodiment of the invention”).

The jury heard ample testimony confirming that a person of ordinary skill in the art would have understood that these two sentences conveyed possession of the invention using particles of any size. Specifically, the inventor himself (Dr. Zebala) and Syntrix’s expert (Dr. Metzker) testified that these sentences convey to a person of ordinary skill in the art an invention that is not limited to particles smaller than 2,000 angstroms. A10301; A10356-57; A10538; A10728.

Other aspects of the specification confirm this interpretation of the disclosure. The specification glossary defines “particles,” and that definition differentiates between certain aspects of particles that are *required*, and certain aspects which are only *preferred*:

***‘Particles’ are discrete objects that when packed together yield a porosity ranging from 0.15 to 0.99***, where porosity is defined as the fraction of the volume of the packed objects that is void space. Particles may have any shape, and may be, for example, spheres, cubes, or irregularly shaped objects. ***Preferably, the objects are substantially spherical (i.e., an object whose surface points are at a distance r+-0.2 r from the object’s center of mass), with a primary particle size ranging from 1 to 1000 Å***. The choice of composition of the particles is such that the porosity is decreased less than 20%, and more preferably less than 5%, after contact with any agent to be employed, including irradiation, photoresist, developers, strippers and reagents. The percent decrease in porosity after contact with such agents can be readily assessed using nitrogen absorption isotherms and the Brunauer-Emmett-Teller (BET) method. Other methods for

assessing the percent loss in porosity after contact with process agents will be apparent to one of ordinary skill in the art.

A74(14:12-30). The patent *requires* (among other things) that particles pack together to form a network with sufficient pores. *Id.* But the patent merely *prefers* certain sizes and shapes of particles. *Id.*

Even to the extent there were any ambiguity as to whether a person skilled in the art would interpret the disclosure that “[p]articles may have any of a variety of sizes and shapes” to disclose particles larger than 2,000 angstroms, the specification and testimony at minimum provide substantial evidence supporting the jury’s determination on this question of fact. *See Hynix*, 645 F.3d at 1352-53 (“Though it would certainly be reasonable to conclude that [patentee’s] claims do not meet the written description requirement . . . that argument was presented to the jury and rejected by it.”). Illumina’s (factually incorrect) claim that “[t]he ’682 patent describes a specific class of small-particle porous coatings (with particles that are at most 2,000 angstroms)” does not satisfy its burden on appeal to establish that “no reasonable jury could have decided that [Illumina] failed to prove by clear and convincing evidence that [claim 1 is] invalid for failure to meet the written description requirement.” *Abbott Labs.*, 334 F.3d at 1357.

**2. Substantial evidence supports the jury's rejection of Illumina's trial theory.**

At trial, Illumina raised a different written description argument: Illumina argued that (a) the claim—even taken as a whole—“doesn’t limit the particle size” at all, whereas (b) the specification limits particles to 1,000 angstroms. A11361-62; A10159; A197. Both parts of Illumina’s argument were wrong and were soundly rejected by the jury.

*First*, Syntrix introduced evidence at trial that the size of particles in claim 1 is not entirely unbounded. Dr. Metzker explained that the surface area size limitation in claim 1 (“each occupying an area on the substrate of less than 1,000,000  $\mu\text{m}^2$ ”) limits particle size to 1.1 millimeters. *See* A112(89:49-50); A11624-25. On cross-examination, Illumina’s expert Dr. Mrksich conceded this point. A11430-32.

*Second*, Illumina argued that particle size was limited to 1,000 angstroms, because the specification stated that “a primary particle size greater than 1000 angstroms yields porous coatings with surface areas too small to be useful in the present invention.” A11362. But that statement is located in a section of exemplary ways a gelled network can be formed and only reflects the particle size needed in one embodiment for a particular application of the invention, not for the invention as a whole. The patent states:

Thus, the surface area and the average pore size of the coating may be tailored by the choice of primary particle size (i.e., the coating has controlled porosity). For example, a metal oxide with a primary particle size of 500 Å will have a surface area of 50 m<sup>2</sup>/g, and a micron thick coating of such particles will increase the ligand density 100-fold. Similarly, a metal oxide with a primary particle size of 200 Å will have a surface area of 200 m<sup>2</sup>/g, and a micron thick coating will increase ligand density 400-fold. In contrast, a primary particle size greater than 1000 Å yields porous coatings with surface areas too small to be useful in the present invention.

A81(27:39-50).

As Dr. Zebala explained, this particular embodiment is only relevant “in applications when you are trying to really optimize signal strength . . . because as your particle[ sizes] go down . . . you get . . . much more increased surface area amplification.” A10310. When read in context of the entire patent—including the disclosure that particles “may have any of a variety of sizes” and the explicit reference to larger 2,000-angstrom particles—it is clear that that the “too small to be useful” phrase only applies to the invention in the particular circumstances of this embodiment, not to the invention as a whole. *See, e.g., Hynix*, 645 F.3d at 1352 (rejecting infringer’s written description argument where inventor testified that particular embodiment was not meant to be “something that all these different features . . . needed to be used with.”); *Lampi*, 228 F.3d at 1378; *cf. Absolute Software Inc. v. Stealth Signal Inc.*, 659 F.3d 1121, 1136-37 (Fed. Cir. 2011) (“[U]se of the phrase ‘present invention’ or ‘this invention’ is not always so

limiting . . . where other portions of the intrinsic evidence do not support applying the limitation to the entire patent") (collecting cases).

**3. Illumina's "class" argument is waived and not supported by the record.**

**i. Illumina's "class" argument is waived.**

Abandoning its original written description theory, Illumina now argues that the '682 patent only supports a "specific class" of "small" porous coating particles, which "are a wholly different set of structures" from the "large" particles found in Illumina's BeadChip products. Br. 25-26. By raising this new "class" theory for the first time on appeal, Illumina has waived it, and the Court can reject it for that reason alone. *See Fresenius USA, Inc. v. Baxter Int'l, Inc.*, 582 F.3d 1288, 1295 (Fed. Cir. 2009) (holding party waived invalidity argument "[b]y failing to properly raise [it] before the district court"); *cf. id.* at 1296 ("[O]ne specific challenge to an anticipation finding does not preserve all possible challenges to that finding.").

**ii. Illumina cites no evidence supporting its "class" argument.**

The key factual underpinning of Illumina's "class" argument is that "[l]arge-particle porous coatings are a wholly different set of structures than the small-particle porous coatings described in the specification." Br. 26 (citing nothing). Illumina cites no evidence to support that assertion, and there is none. The notion of "large-particle porous coatings" and "small-particle porous coatings" is

Illumina's invention on appeal. Illumina's assertions—that the "patent describes a specific class of small-particle porous coatings," Br. 25; "the specification never describes a large-particle coating," *id.*; and, even "increasing surface area with a small-particle coating ... *is* the invention," Br. 27 (emphasis in original)—all rely on this same argument without any evidence in the record or citation to the specification. Moreover, even if this argument had been made to the jury, a reasonable jury would not have been compelled to accept it, much less accept that it proved lack of written description by clear and convincing evidence.

### **iii. Illumina's "class" argument is refuted by the language of the patent.**

To the extent that it is possible to map Illumina's newly-proposed "small" and "large" classes to the patent, the specification confirms that the inventor was in possession of both "small" and "large" particles. Illumina does not quote a single reference to "small particles" or "large particles" in support of its argument; and it ignores the instance in which the specification *does* use those terms. The patent teaches a fabrication process that includes curing to create oxane bonds:<sup>4</sup>

In particular, *small particles* require less oxane bonding than *large particles* due to the increased strength small particles confer to a coating (i.e., secondary to greater numbers of particle-to-particle contacts per unit volume).

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<sup>4</sup> The "particles . . . are bound to one another and the substrate through oxane bonds." A81(27:23-25).

A84(34:51-54). This section of the specification makes clear that the inventor was in possession of both “small particles” and “large particles,” and expressly described how the invention would operate when a “large” particle size was selected.

This Court rejected a similar “class” argument in the face of similar evidence in *Hynix*. See 645 F.3d at 1352. In that case, the patent disclosed a “multiplexed bus,” but included claims that encompassed buses generally—both “multiplexed” and “non-multiplexed.” *Id.* This Court rejected a written description challenge to those claims, concluding that “the supposed genus [buses] consists of only two species, a multiplexed and a non-multiplexed bus,” and that the party challenging validity had “failed to make any argument that persons of ordinary skill would not have understood that [the patentee] possessed a non-multiplexed bus.” *Id.* In particular, the Court relied on “substantial evidence that the invention would not be undermined by the use of a non-multiplexed bus, including testimony from [the patentee’s] expert that a person of ordinary skill would ‘understand[ ] that buses come in all shapes and sizes.’” *Id.* So too here, there was substantial evidence—including the words of the specification themselves—that “[p]articles may have any of a variety of sizes and shapes.” A79(24:52-53). This is more than sufficient to overcome Illumina’s new “class” challenge.

Because the specification is not limited only to a “class” of “small-particle” coatings, the cases cited by Illumina only confirm that there is no lack of written description here. *See Anascape, Ltd. v. Nintendo of Am. Inc.*, 601 F.3d 1333, 1340 (Fed. Cir. 2010) (specification “describes only” one type of controller and not a “larger invention”); *ICU Medical, Inc. v. Alaris Medical Systems, Inc.*, 558 F.3d 1368, 1378 (Fed. Cir. 2009) (“specification describes only” one type of medical valve); *LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1344 (Fed. Cir. 2005) (“specification provides only one method for creating a seamless DWT”); *Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 1159 (Fed. Cir. 1998) (specification “discloses **only** conical shaped cups and nothing broader” and “does not . . . talk in terms of a range of shapes”) (emphasis in original); *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479 (Fed. Cir. 1998) (disclosure “clearly identifies . . . only [one] location” and “no [other] variation . . . is even suggested” in the specification).

**iv. The written description is not limited to one purpose of the invention.**

Illumina also contends that the patent discloses only “small” particles because the invention’s sole purpose “is to increase signal strength.” Br. 26. Illumina’s characterization of the patent’s sole purpose is wrong. To the contrary, the patent repeatedly discloses **multiple** purposes, identifying multiple problems in the prior art that the invention can be used to solve. Many advantages of the

invention relate to the fabrication process, including improvements in the range of materials that could be used (for example, polymers and solvents); fabrication techniques that could be applied (for example, solid-phase chemical synthesis, and photo-patterning as in the semiconductor field), and specific **problems** that could be avoided (for example, swelling, cracks and distortion):

- the prior art used polymers that could only accept receptors of small sizes because of limits on diffusion; A68(1:56-59)
- the prior art used polymers that were not compatible with solid-phase chemical synthesis, because they required swelling and solvation; A68(1:59-61)
- the prior art methods could not be photo-patterned efficiently; A68(1:63-66)
- the prior art had parallel pore orientation, which was technically cumbersome because it requires a flow-through apparatus; A68(2:17-19)
- it was not clear that the prior art could support multiple rounds of synthetic reactions; A68(2:20-21)
- the prior art metal oxide was incompatible with microfabrication methods; A68(2:22-24)
- the prior art porous supports had not been applied to microfabrication of ligand arrays; A68(2:33-35)
- the prior art could not detect specific binding characteristics of macromolecule receptors; A68(2:46-48)
- the prior art could not be used with organic solvents because the solvents would swell and distort the coatings; A68(2:63-65)
- the prior art coatings formed cracks and were nonuniform and discontinuous; A69(3:12-13)

- the prior art coatings “have not been patterned using microfabrication techniques, *or* used to increase ligand surface density, detect ligand-receptor binding, *or* prepare ligand arrays by solid-phase chemical synthesis.” A69(3:14-17).

The patent discloses again and again how to solve these multiple problems.

*See, e.g.*, A71(7:4-12) (claimed invention “can be applied and patterned with high sensitivity using microfabrication techniques,” and “are compatible with the production of ligand arrays by solid-phase synthesis,” and “do not swell or distort substantially during ligand-receptor binding or solid-phase chemical synthesis” and “do not require a flow-through apparatus”); A78(22:17-21) (articles provided in the invention “may also be patterned using a photoresist and photolithographic methods in a fashion which allows exemplary reproducibility and control over the dimensional features of the patterned porous coating”). The patent states that:

An important aspect of the present invention is the discovery that porous coatings provide excellent supports for performing solid-phase chemical synthesis of ligands and detecting bound ligands with labeled macromolecular receptors, using a variety of protocols and reagents. In contrast to supports that require swelling and solvation for efficient mass transfer of reagents, the rigid porous network of the present invention is permanently open and resides on the surface of the substrate. Reactive groups on the surface are therefore substantially accessible by any reagent directly contacting the support. Accordingly, the flow-through apparatus required to apply reagents to the parallel and highly elongated sub-surface pores of the acid-etched porous silicon and electrochemically manufactured metal oxide membrane of the prior art is not necessary[.]

A86(37:57-38:4). A reasonable jury could easily have rejected Illumina’s “purpose” argument, had it been made below.

**v. The written description is not limited to the embodiments.**

Finally, Illumina is wrong to suggest that the '682 patent cannot satisfy the written description requirement unless the specification includes specific embodiments using particles larger than 2,000 angstroms.<sup>5</sup> Br. 25-26. This Court has repeatedly rejected that view of the written description requirement. “[I]t is unnecessary to spell out every detail of the invention in the specification; only enough must be included to convince a person of skill in the art that the inventor possessed the invention . . . .” *LizardTech*, 424 F.3d at 1345; *see also id.* (“A claim will not be invalidated on section 112 grounds simply because the embodiments of the specification do not contain examples explicitly covering the full scope of the claim language.”); *Ariad*, 598 F.3d at 1352 (“[T]he written description requirement does not demand either examples or an actual reduction to practice.”); *Martek*, 579 F.3d at 1371 (finding claim not “invalid for lack of written description just because it is broader than the specific examples disclosed”).

At trial, the inventor explained that he did not need to “test a 1 million angstrom particle” because he “knew it would work in the invention as [he] was using it.” A10303. For this same reason, he had no need to provide examples

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<sup>5</sup> Illumina suggests that, because the Seul application (WO 97/40385) and Walt '540 patent explicitly reference particles as large as 10 million angstroms, the '682 patent has to as well. Br. 29-30. Illumina cites no support for its proposition that a jury cannot find adequate written description support unless the patent contains the very same disclosure contained in prior art references.

using particles that large; the specification disclosed them when stating that particles may have “any of a variety of sizes.” A79(24:52-53); *see also Martek*, 579 F.3d at 1371 (“[T]he fact that the working examples disclose different preferred growth conditions . . . does not teach away from [claim requirement that cells be grown together because] the application describes growth conditions generally suitable for all disclosed strains . . .”); *Lampi*, 228 F.3d at 1378 (finding written description sufficient to support a class of “non-identical half-shells” when “the patent drawings show only identical half-shells”).

While the specification adds that particles smaller than 2,000 angstroms are “preferable,” Syntrix’s expert Dr. Metzker credibly testified that a person of skill in the art would understand that it adequately discloses porous coating particle sizes up to the limit of 1.1 millimeters. *See A11624-25*. Illumina asks this Court to discredit Dr. Metzker’s testimony, Br. 31, but has not even appealed the district court’s rejection of its *Daubert* challenge to his opinions. As the district court stated, “On the questions of fact before the Court, the jury sided with Syntrix’s expert, Dr. Michael Metzker.” A34. This Court should “not substitute [its] view of the evidence or [its] credibility determinations for those of the jury.” *Martek*, 579 F.3d at 1369; *see also id.* at 1371 (rejecting infringer’s criticism of expert testimony where expert “relied on specific statements in the [patent] application and explained how, in his opinion, a person of ordinary skill in the art would

understand those statements.”). The cases cited by Illumina are inapposite because, unlike Dr. Metzker’s opinions, they describe expert testimony that relied on wrong sections of the patent, *Tronzo*, 156 F.3d at 1159, or was “not supported by any evidence at all.” *Anascape*, 601 F.3d at 1339.

At minimum, the specification’s language and Syntrix’s expert testimony create a factual dispute as to whether the patent sufficiently discloses particles larger than 2,000 angstroms, and the jury reasonably resolved this dispute in Syntrix’s favor. Illumina has not met its high burden to reverse the jury’s finding of sufficient written description.

#### **B. The Court Correctly Construed “Gelled Network of Particles.”**

As a fallback to its written description challenge, Illumina asserts that the district court erred when it refused to construe the claimed “gelled network” to require the additional limitation of “multiple layers.” Br. 32. The district court’s claim construction was correct. The specification provides a glossary that defines “gelled network,” and the district court correctly construed the term just as set forth in the glossary—which places no limitation on the number of layers.

Nothing in the claims, the specification, or the prosecution history supports Illumina’s limiting construction. Illumina cannot and does not point to any language in the patent that describes the claimed network in terms of “layers” at all. Rather, Illumina disregards every one of the nearly ***two hundred*** instances in

which the patent *does* refer to “layers” in discussing other aspects of the invention—because none of them support Illumina’s request to add a “layers” limitation to “gelled network.”

Without support in the specification for its “layers” theory, Illumina is left with the contention that the claim’s language and the specification’s definition are trumped by what Illumina identifies as “the invention’s stated purpose.” Br. 34. This Court has seen that argument before, and has consistently rejected it. As discussed above, the invention of the ’682 patent solved multiple problems and advanced multiple purposes, and Illumina cannot pick one of those purposes and use it to justify importing a limitation into the claims.

1. The specification defines “gelled network of particles” exactly as the district court construed it.

“[T]he specification may reveal a special definition given to a claim term by the patentee” and, “[i]n such cases, the inventor’s lexicography governs.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005). This is such a case. The ’682 patent contains a glossary of express “definitions,” which defines “gelled network” without reference to “layers,” and in a way that focuses on how the particles are held together in place:

‘Gelled network’ refers to an aggregation of particles linked together to form a porous three-dimensional network. Particles may be linked covalently or noncovalently through the use of a polymeric binder. Alternatively, particles may be linked covalently or noncovalently without the use of a binder, through interactions of chemical groups

on the surface of the particles. Covalent interactions between polymeric binders or surface groups include the formation of, for example, oxane bonds (*e.g.*, —O—Si—O—, —O—Ti—O—, —O—Al—O—, —O—B—O—, —O—Zr—O—, —O—Er—O—, —O—Cr—O—O—Ga—O—, —O—Ge—O—, O—Hf—O—, —O—Fe—O—, —O—Ca—O—, —O—Cr—O—, —O—La—O—, —O—Mg—O—, —O—Nb—O—, —O—K—O—, —O—Pr—O—, —O—Sm—O—, —Na—O—, —O—Ta—O—, —O—Te—O—, —O—Tl—O—, —O—Sn—O—, —O—W—O—, —O—V—O—, —O—Y—O—, and —O—Zn—O—), linkages between an epoxide (*e.g.*, glycidoxypropyltrimethoxysilane) and a polyamine (*e.g.*, triethylene tetramine), and photoinduced linkages using, for example, a bis-azide. Noncovalent interactions that may be employed in polymeric binders or surface groups include, for example, electrostatic interactions, hydrogen bonding, metal coordination, and Van der Waals interactions. In some embodiments, particles will be linked by a mixture of covalent and noncovalent interactions. The extent of linking sufficient to constitute a ‘gelled network’ will be such that less than 20%, and more preferably less than 5%, of the network is lost after contact with any process agent (*e.g.*, irradiation, photoresist, developers, strippers and reagents). Accordingly, the extent of linking required will depend on the exact nature of the process agents. For example, photoresists that exhibit higher degrees of swelling will require gelled networks with higher degrees of linking so as to balance the forces of swelling and prevent physical disruption of the gelled network. The percent loss of the network after contact with process agents can be readily assessed using nitrogen adsorption isotherms and the Brunauer-Emmett-Teller (BET) method. The BET method allows the surface area of the gelled network to be accurately measured, and the percent change in surface area after contact with a process agent will be equivalent to the percent loss of the gelled network. Other methods for assessing the percent loss of the gelled network after contact with process agents will be apparent to one of ordinary skill in the art.

A73(11:20-65). The district court construed the term exactly as the specification’s glossary defined it. A11779-80.

As Syntrix explained to the district court, the term “gelled network” describes “*the way the network holds the particles.*” A20074. The particles are “gelled,” meaning linked into place, not unlike how we say that an idea or an argument has “gelled” (or “jelled”) when its components fit together and it takes on definite form. The particles do not sit “on” a surface, as in the prior art; instead, they are held “in” a network. As Syntrix’s technical expert Dr. Metzker explained to the jury, “[i]t’s very important that the particles are linked together -- that can be by direct or indirect linking -- forming the three-dimensional network.” A10779. The inventor, Dr. Zebala, similarly explained at the *Markman* tutorial that, “[o]nce the beads get assembled and stuck together, you can think of it as a skeleton, a rigid skeleton.” A20016. He explained the term “gelled network”:

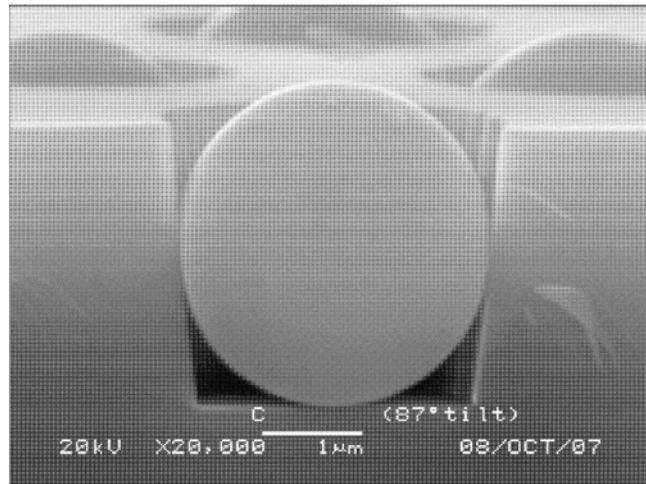
[I]t’s not loose particles. That’s the important thing to remember. They are held together … if you were to take the slide that I prepared … and I turn it upside down, those particles don’t fall down. So they are not loose.

A20023.

The specification accordingly defines a “gelled network” by how the particles are held together. The definition first identifies the binders, bonds, and interactions that link the network. A73(11:20-46). The definition then specifies, in numerical terms, “the extent of linking sufficient to constitute a ‘gelled network,’” in light of the fabrication techniques disclosed in the patent. *Id.*(11:46-50). That is, “less than 20%, and more preferably less than 5%, of the network is lost after

contact with” the disclosed fabrication techniques. *Id.*(11:46-50). These details of the glossary definition demonstrate how the claimed “gelled network” serves **several** purposes of the invention: to create coatings that “are compatible with the production of ligand arrays by solid-phase synthesis,” “do not swell or distort substantially during ligand-receptor binding or solid-phase synthesis,” and can be fabricated using the tools of “microfabrication.” A71(7:4-12).

Illumina’s infringing products exemplify these benefits. Illumina did not place its beads loose on top of a glass surface. Instead, Illumina formed a gelled network of particles, by placing beads into wells of silicon dioxide, where the beads are held in place by the Van der Waals interactions with a silicon dioxide layer,<sup>6</sup> exactly as described in the definition of “gelled network” in the specification:

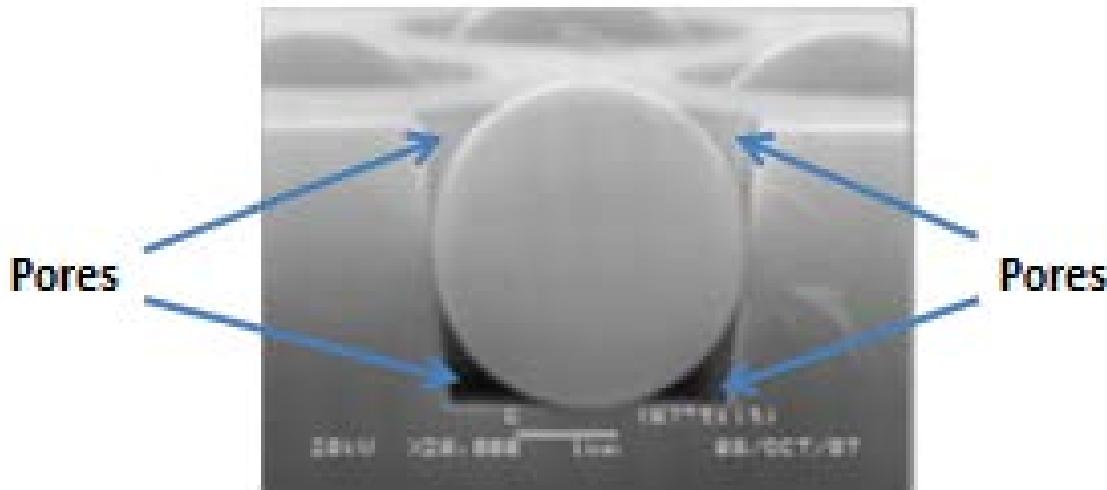



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<sup>6</sup> Silicon dioxide—the binder in the infringing products—is the first example of a polymeric binder disclosed in the definition of “gelled network” in the specification. *See* A73(11:20-65) (*e.g.*, —O—Si—O—).

A1654.

The “three-dimensional” characteristic of the gelled network is how the gelled network forms the “porous coating” recited in the claim. The glossary defines “porous,” by the size and extent of the empty volumes within the coating. A75(16:58-61) (“[a] coating is said to be ‘porous’ if it contains void regions ranging from 1 to 1500 nm in diameter resulting in porosities ranging from 0.15 to .99, where porosity is defined as the fraction of the coating volume which has pores”). Those empty volumes—the “pores” of the “porous coating”—are found within the three-dimensional network. Again, Illumina’s infringing products exemplify the benefit: the three-dimensional network provides empty spaces for the chemical reactants to contact the compounds on the beads:



A1654 (annotation added). A three-dimensional network provides pores above, below, and to each side of the particles, whether it has one, two, ten, or hundreds of layers of particles.

There is no dispute on appeal that Illumina's infringing products contain a "porous three-dimensional network"—*i.e.*, the "gelled network" as the district court defined it, according to the glossary in the specification. The district court instructed the jury to apply the glossary definition; the jury found infringement; and Illumina has not challenged that infringement determination on appeal. The only dispute is whether—in addition to satisfying all of the requirements of the glossary definition—the claimed "gelled network" must also satisfy the requirement of "multiple layers" that appears nowhere in the definition.

**2. The patent does not support Illumina's "multiple layers" construction.**

**i. Illumina's "multiple layers" construction has no support anywhere in the claims, specification, or file history.**

The claims do not limit a "gelled network" to a network comprising "multiple layers." This Court "has repeatedly and clearly held that it will not read unstated limitations into claim language." *Northern Telecom Ltd. v. Samsung Electronics Co.*, 215 F.3d 1281, 1290 (Fed. Cir. 2000). Indeed, the Court emphasized that rule in rejecting an effort to add the term "layer," when "the term

‘layer’ does not appear anywhere in the text of [the] claim.” *Id.* at 1290. Thus, Illumina’s “multiple layers” find no support in the claims.

Nor does the specification support Illumina’s position that a “gelled network” must necessarily contain “multiple layers.” In fact, throughout its brief, Illumina simply asserts that the gelled network “must” have multiple layers—either without citation or with citations that do not say what Illumina wants them to. For example, Illumina argues on the first page of its brief that “[t]he patent emphasizes that the porous coating must be formed from many layers . . . .” Br. 1 (citing A81(27:42-50)). But the cited portion of the patent **does not refer to layers at all**. Nor does it, or any other portion of the patent, **ever** state that the coating must be formed of multiple layers—much less “emphasize[]” such a requirement.

Illumina later repeats its assertion that “the ‘gelled network of particles’ **must** have multiple layers.” Br. 7 (no citation to the patent). Illumina then follows that assertion with seven quotations from the patent, **none** of which refers to “layers” at all. Br. 8-10 (quoting A81(27:35-42), A79(24:52-57), A81(27:42-50); A73(11:20-21); A81(27:64-28:5); and A107(79:45-52).) In fact, **not a single one** of the scores of references to “layers” in Illumina’s brief is a quotation from the patent. Every time Illumina uses the word “layer” is pure attorney argument.

The patentee knew how to refer to “layers” to define the invention when he intended to. Twenty-one claims of the patent use the term “layer.” A112-16

(Claims 16, 17, 18, 41, 53, 59, 61, 62, 63, 66, 69, 78, 79, 86, 88, 103, 110, 112, 113, 116, and 121 claiming, for example, “adhesive layer”; “substantially uniform layer”; “fortifying layer”; “0.002 to 2 micron thick adhesive layer”; and “layer of photoresist”). The specification uses the term “layer” more than 160 times.<sup>7</sup>

When the number of layers matters, the specification discloses exactly what the number should be: “20 patterned photoresist layers,” “five patterned photoresist layers,” “two layers of PNA monomers.” A101(67:23-25); A108(82:39). *Not a single one* of the scores of references to “layers” in the patent supports Illumina’s proposed construction, because the patent never refers to the gelled network as having multiple layers. This is presumably why Illumina never cited even one of the patent’s references to layers in its brief.

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<sup>7</sup> A69-111 at 4:21, 4:23, 4:27, 5:46, 5:54, 5:56, 5:58, 5:59, 7:32, 7:37, 7:42, 7:45, 7:49, 7:56, 7:58, 9:1, 9:2, 9:7, 9:8, 9:9, 9:11, 9:19, 9:61, 9:64, 9:66, 10:4, 10:5, 10:67, 11:2, 11:7, 11:8, 11:10, 11:15, 12:31, 16:27, 16:39, 16:40, 21:64, 22:50, 22:52, 22:58, 23:9, 23:29, 23:31, 23:32, 23:38, 23:52, 23:53, 23:54, 23:55, 23:58, 23:61, 23:62, 24:19, 24:21, 24:23, 24:28, 24:37, 25:40, 27:10, 28:12, 28:56, 29:43, 29:59, 29:61, 30:50, 30:63, 31:5, 31:9, 31:20, 31:27, 31:46, 32:14, 32:33, 32:53, 32:62, 34:42, 39:3, 39:5, 39:19, 39:23, 39:25, 39:27, 39:28, 39:29, 39:31, 39:32, 39:39, 39:61, 47:45, 47:56, 48:2, 48:9, 48:57, 48:61, 49:4, 50:67, 51:2, 51:8, 51:11, 51:15, 51:21, 51:23, 51:35, 51:40, 52:27, 53:12, 62:19, 62:23, 67:23, 67:25, 67:29, 71:28, 71:29, 71:31, 71:35, 71:41, 71:42, 71:43, 71:45, 71:47, 72:23, 74:15, 74:18, 74:20, 74:22, 73:32, 74:62, 74:64, 75:41, 75:42, 76:42, 76:67, 77:15, 78:42, 78:52, 79:1, 79:4, 79:5, 79:9, 79:12, 82:39, 82:40, 82:44, 82:54, 82:58, 82:61, 82:67, 83:7, 83:8, 83:10, 83:13, 84:55, 86:15, 86:20, 86:21, 86:25, 86:26, 86:30, 86:41, 86:45, 86:49, 86:59, 87:1, 87:2, 87:13, 87:16, and 87:24.

In lieu of support from the patent, Illumina relies on repetition of its hoped-for conclusion: “A three-dimensional network of particles has multiple layers.” Br. 32 (with no citation). Often, Illumina simply includes an “*i.e.*” between “three-dimensional network of particles,” and “multiple layers of particles.” Br. 9, 11, 21. But such unsupported assertions cannot be the basis of claim construction. *Cf. Phillips*, 415 F.3d at 1318 (concluding that “unsupported assertions [even] by experts as to the definition of a claim term are not useful to a court”).

**ii. Every authority cited by Illumina confirms that the district court was correct to construe “gelled network” according to the terms in the patent.**

Illumina cites a variety of claim construction cases—but every one of them relies on the specification’s actual use of the language that the Court concluded limited the claim; Illumina cites no case in which this Court grafts a limitation—here, “multiple layers”—onto a claim when that limitation appears nowhere in the specification.

First, Illumina cites *Retractable Techs. v. Becton, Dickson, & Co.*, where this Court construed the claim term “syringe body” to require a one-piece body. 653 F.3d 1296, 1304-05 (Fed. Cir. 2011). Illumina incorrectly characterizes that decision as resting on the bare fact that figures in the specification depicted a one-piece body. Br. 34. But this Court actually relied on the fact that the specification expressly and repeatedly characterized the invention in the precise terms adopted

by the Court: “one-piece body.” The Court quoted the express language in the specification stating that prior art failed to recognize a retractable syringe that “can be molded as one piece outer body.” *Retractable Techs.*, 653 F.3d at 1305 (quoting patent). The Court emphasized that “the specifications, in describing the invention, ***expressly state that*** each syringe embodiment contains a one-piece body.” *Id.* (quoting specification stating twice that an embodiment “has a one piece hollow outer body” and has “a one piece hollow outer syringe body.”). The Court then added that, “in addition, each figure that depicts a syringe shows a one-piece body.” *Id.* Moreover, the Court acknowledged that “[t]here is a fine line between construing the claims in light of the specification and improperly importing a limitation from the specification into the claims.” *Id.* The Court reached its construction because the patents’ specifications “expressly recite that ‘the invention’ has a body constructed as a single structure, expressly distinguish the invention from the prior art based on this feature, and only disclose embodiments that are expressly limited to having a body that is a single piece.” *Id.*

The ’682 patent is far to the other side of that line: it ***never*** states that the invention contains a certain number of layers, it never distinguishes prior art based on the number of layers, and it never describes any embodiment by counting layers. Likewise, nowhere in the entire prosecution history—including the re-examination that cited several pieces of monolayer prior art—did the inventor ever

distinguish over the prior art by claiming his invention was limited to multiple layers. *See, e.g.*, A21-22 (district court’s claim construction order discussing treatment of single-layer art in reexamination).

Illumina also cites *Hologic, Inc. v. SenoRx, Inc.*, where this Court construed the claim term “asymmetrically located” to mean asymmetrically located with respect to the longitudinal axis of the device. 639 F.3d 1329, 1338 (Fed. Cir. 2011). But Illumina does not mention that, just as in *Retractable Technology*, the Court relied on the patent’s repeated and express use of the *exact term* used in construction by the Court. The Court quoted at length statements in the specification that the disputed element was “asymmetrically placed with respect to a longitudinal axis,” *id.* at 1335, was placed “asymmetrically with respect to the longitudinal axis,” *id.* at 1336, “has an asymmetric configuration with respect to a longitudinal axis,” *id.*, and “is asymmetrically shaped or located with respect to the longitudinal axis.” *Id.*; *see also id.* at 1339 (Friedman, J., dissenting) (“The court accomplished this construction of the patent language primarily by incorporating into that language the ‘longitudinal axis’ limitation that is stated several times in the specification.”).

Illumina’s other cases are similar. In *LizardTech*, the Court construed a digital compression as “seamless” where “[t]hroughout the patent, the wavelet-based compression process is referred to as seamless.” 424 F.3d at 1343 (citing

three examples from the text of the patent, including, “in accordance with the present invention, a method is provided for the seamless wavelet-based compression . . .”). In *Bayer CropScience AG v. Dow AgroSciences LLC*, 728 F.3d 1324, 1327-28 (Fed. Cir. 2013), the Court held that a claim expressly directed to one class of chemicals (“monooxygenase”) did not extend to a different, mutually exclusive class of chemicals (“dioxygenase”). In contrast to every decision Illumina cites, Illumina asks the Court to add a limitation—“multiple layers”—that not only appears nowhere in the claim, but that *never* even appears in the specification or file history at all.

**iii. Illumina’s “multiple layers” construction improperly seeks to limit the claim to one purpose of the invention.**

Illumina’s last argument for its “multiple layers” construction is one that this Court has rejected again and again: Illumina incorrectly seeks to add a limitation to reflect one “purpose” of the invention. In case after case, this Court has held:

The court’s task is not to limit claim language to exclude particular devices because they do not serve a perceived ‘purpose’ of the invention . . . . An invention may possess a number of advantages or purposes, and there is no requirement that every claim directed to that invention be limited to encompass all of them.

*Howmedica Osteonics Corp. v. Wright Medical Tech., Inc.*, 540 F.3d 1337, 1345 (Fed. Cir. 2008); *Praxair, Inc. v. ATMI, Inc.*, 543 F.3d 1306, 1325 (Fed. Cir. 2008) (same) *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1370 (Fed. Cir. 2003)

(same); *see also Kim v. ConAgra Foods, Inc.*, 465 F.3d 1312, 1319 (Fed. Cir. 2006) (refusing to limit claim based on “one object of the invention”); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 908 (Fed. Cir. 2004) (“The fact that a patent asserts that an invention achieves several objectives does not require that each of the claims be construed as limited to structures that are capable of achieving all of the objectives.”); *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1301 (Fed. Cir. 2003) (refusing to limit claim where “[t]he objective described is merely one of several objectives that can be achieved through the use of the invention”); *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 1355 (Fed. Cir. 2003) (claim not limited to “one of several objectives that can be achieved through use of the invention”); *Resonate Inc. v. Alteon Websystems, Inc.*, 338 F.3d 1360, 1367 (Fed. Cir. 2003). The common principle running through all these decisions is that, when a claimed invention may solve one or more of several problems, an infringer cannot evade liability by picking one “purpose” of the invention and importing it into the claim.

Illumina runs square into this rule. Just as its written description theory is built on the false premise that “[t]he invention’s purpose is to increase signal strength,” Br. 26, Illumina justifies its desired claim construction by asserting that “the invention’s stated purpose—significantly increasing surface area to significantly increase signal strength—requires multiple layers.” Br. 34. As

discussed in the written description argument, *supra* pgs. 9-10, 33-35, the '682 patent discloses more than one purpose. Of all those purposes (which Illumina does not address), the “gelled network” is useful, at minimum, for microfabrication methods. The glossary defines “gelled network” specifically with regard to its ability to be used with the fabrication “process agent[s],” that the patent discloses, which are not directed to any number of layers. A73(11:47-50). Thus, as in *Howmedica, E-Pass, Praxair, ConAgra, Brookhill-Wilk, Liebel-Flarsheim, Northrop Grumman, and Resonate*, this Court should not isolate one purpose of the invention and limit all claims to it.

**3. Illumina took a contrary position on “gelled network” when it submitted a third-party reexamination request.**

Illumina itself has implicitly acknowledged that the “gelled network” limitation encompasses a single layer of particles. When Illumina submitted its third-party reexamination request to the Patent Office, it argued that the single layer of beads described in a prior art reference satisfied the “gelled network” limitation, such that the reference anticipated claim 1 of the '682 patent. *See* A20359; A20361; A20402. The Patent Office correctly confirmed the patentability of claim 1 over that reference for other reasons. But the fact that Illumina itself did not (until this litigation) interpret “gelled network” as limited to “multiple layers” confirms the correctness of the district court’s construction.

**4. At minimum, the district court’s reliance on expert testimony is entitled to deference.**

Even under *de novo* review, the district court’s claim construction of “gelled network” should be affirmed. But if a more deferential standard applies in any case, it should apply here. The Supreme Court is currently considering whether a court of appeals should defer to a district court’s findings regarding “what a person of ordinary skill in the art would have discerned from the patents” based on expert testimony. *See Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.*, 723 F.3d 1363 (Fed. Cir. 2013), *cert. granted*, 2014 WL 199529, at \*9 (Mar. 31, 2014). Here, the district court expressly credited expert testimony that the patent claims were broad enough to cover Illumina’s product:

Dr. Metzker, a person of ordinary skill in the art as the Court has found, or concluded, has provided an explanation how in his opinion a ‘gelled network of particles as an aggregation of particles linked together (forming) a porous three-dimensional network’ can include a monolayer of beads in a well as it is represented in the Illumina BeadChip product.

A10939. In denying Illumina’s motion to judgment as a matter of law, the district court elaborated that the testimony from Syntrix’s expert “was persuasive evidence” that the court correctly construed the claims:

With regard to the claim constructions, the Court listened intently to each expert’s position on how one of ordinary skill in the art would interpret the ’682 Patent. While expert testimony is unlikely to be reliable in guiding the court’s claim construction (*see Phillips v. AWH Corp.*, 415 F.3d 1303, 1319 (Fed. Cir. 2005)), Dr. Metzker’s

testimony was persuasive evidence that the Court's rulings were correct.

A34. Under the standard advocated by Teva, that factual determination is entitled to deference, and it provides an independent basis for affirming the district court's claim construction.

**5. The jury finding of adequate written description is supported by substantial evidence.**

Illumina's contention that the patent lacks a written description of "a single layer," Br. 41, "merely revives its non-infringement argument in the cloak of a validity challenge." *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1321 (Fed. Cir. 2003). Like Illumina's claim construction argument, its written description attack consists of the unsupported assertion that "the specification explicitly encourages using more layers," Br. 41; but again, Illumina does not quote even one reference to "more layers" in the patent to show this purportedly "explicit" encouragement.

To the contrary, the specification never describes the gelled network of particles in terms of "multiple layers" at all. Illumina's improper attempt to restrict the invention to "multiple layers" therefore has no support in the patent. This Court has rejected similar written description arguments. *See, e.g., Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1364-65 (Fed. Cir. 2003) (rejecting written description defense that specification only supports a mixture of slots where "such

a mixture was not conveyed as critical to the invention nor was it described as the only feasible design in the disclosure”); *see also id.* at 1365 (“A specification may . . . contain a written description of a broadly claimed invention without describing all species that [the] claim encompasses.”).

Illumina further contends that the patent is invalid because it does not present an *example* with a single layer of particles. Br. 41. Because Illumina made up the idea of counting layers, which has no basis in the patent, it is neither surprising or significant that the patent does not present an example of a “single layer.” “[I]t is clear that the absence of examples . . . does not render the written description inadequate.” *Falko-Gunter Falkner v. Inglis*, 448 F.3d 1357, 1366 (Fed. Cir. 2006).

Illumina also asserts, without citing testimony, that the patent “would convey to the skilled artisan” that “a single layer of particles is ‘insufficient’ and outside the scope of the invention.” Br. 41-42. But the jury heard and plainly credited expert testimony directly to the contrary. *See A10534-38* (Dr. Metzker explaining in detail how “you can have a single layer of beads as described in the ’682 patent.”); A10939; A34.

Nor do the cases that Illumina cites advance its argument. Illumina lists the names of various cases (“*Anascape*, *Tronzo*, *LizardTech*, *Gentry Gallery*, and the other cases cited above”) but makes no attempt to demonstrate how they support its

argument. Br. 42. *Anascape* found a lack of written description for a device using less than six degrees of freedom where the specification contained “over twenty explicit statements that the invention is directed to a [device] that is operable in six degrees of freedom.” 601 F.3d at 1336. In contrast, Illumina quotes *zero* statements from the ’682 patent that the invention is directed to multiple layers. *Tronzo* similarly relied on the language in a patent to find that the disclosure was limited to devices with shapes explicitly named there: a “trapezoid,” a “truncated cone,” and a “conical shape.” 156 F.3d at 1159. That reasoning provides no support for Illumina’s attempt to limit the disclosure of the ’682 patent with a limitation (“multiple layers”) that is never used in the patent. *Gentry Gallery* likewise limited a disclosure based on the actual words of the patent: because the patent disclosed that a control “may be mounted on top or side surfaces of the console,” the written description was understood to be limited to controls mounted on consoles. 134 F.3d at 1479. None of these decisions allows an infringer to narrow the scope of the disclosure of the written description with new terms of its own creation.

### **III. THE DAMAGES AWARD SHOULD BE AFFIRMED.**

Illumina does not dispute that the jury’s damages award was supported by substantial evidence. Instead, Illumina disputes only the admissibility of Mr.

Ratliff's testimony regarding the stock Illumina provided to Dr. Walt. Br. 43-44.

Illumina has failed to show an abuse of discretion.

**A. The Stock Payment To Dr. Walt Was Admissible And Relevant To The Reasonable Royalty Rate.**

“[A] district court abuses its discretion when it bases its decision on an erroneous view of the law or a clearly erroneous assessment of the facts.” *United States v. Rahm*, 993 F.2d 1405, 1410 (9th Cir. 1993). Here there is no doubt about the law, and no error about the facts. As Illumina itself acknowledges, *see* Br. 43, one of the relevant *Georgia-Pacific* factors for determining a reasonable royalty is “the rates paid by the licensee for the use of other patents comparable to the patent in suit.” *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1325 (Fed. Cir. 2009) (*quoting Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970)). Illumina’s expert conceded at trial that the license to the Tufts patents was “the most relevant license” when determining a reasonable royalty for the ’682 patent. A11452-53 (Illumina’s expert: “Both Mr. Ratliff and myself, as I pointed out, agree that this is the most relevant license to use in doing this analysis as a starting point.”). The sole remaining issue is whether evidence of Illumina’s grant of stock to Dr. Walt was properly admitted, and if so, whether Mr. Ratliff was properly allowed to testify about it as part of his analysis of “the rates paid by the licensee.”

Illumina dresses its argument in the guise of legal error, but it is nothing more than an evidentiary dispute. Before trial, the district court correctly ruled that evidence of the stock grant was admissible because there was ample basis for the jury to conclude that the stock was part of the payment for the patents. Tufts initially demanded a 6% royalty, and it later accepted a 3% royalty at the same time that its researcher received the stock:

[T]he inference that Tufts University received a lower royalty rate from Illumina in return for its doctor receiving a partial stake in Illumina is reasonable. Attacking this inference goes to the weight of Mr. Ratliff's opinion and not to any fundamental deficiency.

A52.

The evidence at trial showed that the district court was correct, and that the stock was in fact part of the payment that Illumina used to license the comparable Tufts patents. As Mr. Ratliff explained to the jury, the stock grant was one part of an "overall transaction," made up of the patent license agreements as well as other agreements, all of which were executed at about the same time. A10846-47. Under the agreements, Illumina paid a royalty and additional consideration, including laboratory and research funding and stock grants to Tufts and to Dr. Walt. *Id.* The evidence supports Mr. Ratliff's analysis.

*First*, the operative agreements show on their face that the stock grant was part of the overall transaction. The Illumina-Tufts license expressly includes the prescribed allocation of Illumina stock as *part of* the agreement. Section 19.3 of

the license defines the “Entire Agreement” as “[t]his agreement and *any exhibits* attached hereto (*each of which is hereby made part hereof* by this reference).”

A3428. The agreement includes two exhibits: a list of the licensed patents, and the distribution of Illumina stock. A3430-31. That distribution of Illumina stock lists distribution to “MBRI/TUFTS” and to “Founders” (among others). A3431. Dr. Walt was indisputably among the “[f]ounders” of Illumina (A10908; A11154-55), and it was more than reasonable for the jury to conclude that everyone—Illumina, Tufts, and Dr. Walt—knew that Dr. Walt received shares allocated to “Founders” as part of the very agreement that granted a license to Illumina.

**Second**, the chronology of the negotiation shows that Illumina used the stock payment to close the deal to secure the patent license. Tufts initially sought a 6% royalty rate from Illumina. A10847. In the end, Illumina paid a 3% royalty, plus funding for research, and stock. *Id.* It was reasonable for the jury to conclude that the parties structured the deal to use a mix of compensation including royalty, research funding, and stock.

Illumina’s arguments do not show that the district court was wrong about the facts, much less that it abused its discretion by permitting Mr. Ratliff to testify about the stock grant aspect of the agreement. Illumina emphasizes that Dr. Walt had assigned his patent rights to Tufts, and that the stock grant was “outside of” his legal relationship with Tufts. Br. 44. But like the chronology of the negotiation

and the inclusion of the stock grant in the exhibits to the license, the relationship between Dr. Walt and Tufts is simply circumstantial evidence that goes to whether Illumina used the stock grant to pay for the patent rights. Illumina was free to challenge Mr. Ratliff's view of the facts at trial, and it did so. The existence of a factual dispute does not show that the district court abused its discretion. *See, e.g.*, *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1333 (Fed. Cir. 2012) ("Verizon's disagreements are with the conclusions reached by ActiveVideo's expert and the factual assumptions and considerations underlying those conclusions, not his methodology. These disagreements go to the weight to be afforded the testimony and not its admissibility."); *i4i Ltd. Partnership v. Microsoft Corp.*, 598 F.3d 831, 856 (Fed. Cir. 2010) ("[I]t is not the district court's role . . . to evaluate the correctness of facts underlying an expert's testimony. Questions about what facts are most relevant or reliable to calculating a reasonable royalty are for the jury."); *Micro Chemical, Inc. v. Lextron, Inc.*, 317 F.3d 1387, 1392 (Fed. Cir. 2003) ("When, as here, the parties' experts rely on conflicting sets of facts, it is not the role of the trial court to evaluate the correctness of facts underlying one expert's testimony").

Because Illumina's grant of stock to Dr. Walt was relevant under *Georgia-Pacific* factor 2, the decisions cited by Illumina provide no basis for overturning the jury's award. In *ResQNet.com, Inc. v. Lansa, Inc.*, this Court vacated the

award because the patentee relied on licenses involving non-patented software and “did not provide any link” between those licenses and the patents-in-suit. 594 F.3d 860, 870-71 (Fed. Cir. 2010). Here, in contrast, the testimony at trial provided that link: Illumina provided the stock grant to obtain the Tufts patents, which both damages experts agreed were “comparable to the patent in suit.” *Georgia-Pacific*, 318 F. Supp. at 1120; A11452-53. In *Lucent Techs.*, this Court vacated the award because some licenses were “radically different from the hypothetical agreement under consideration” and because the Court was “unable to ascertain from the evidence presented the subject matter” of certain others. 580 F.3d at 1327-28. Here, however, there is no dispute about the subject matter of the Illumina-Walt agreement. Furthermore, the evidence at trial demonstrated the similarities and links among the Illumina-Walt agreement, the Illumina-Tufts license, and the hypothetical Illumina-Syntrix license.

Illumina’s argument completely neglects another, independent reason that the district court did not abuse its discretion by admitting testimony about the Walt stock: regardless of the damages theory, Dr. Walt’s stock grant was independently admissible as evidence of his bias as a witness. Immediately before Mr. Ratliff’s testimony, Illumina renewed its challenge to his testimony regarding the Walt stock. A10812. The court disagreed, noting that “[t]o the extent that [Walt] has a financial interest in Illumina, that is a legitimate area of inquiry for the

determination of bias.” A10813. Illumina does not even *mention*, much less challenge, the admissibility of the Walt stock for this independent purpose. *See e.g., Ferring B.V. v. Barr Labs., Inc.*, 437 F.3d 1181, 1187 (Fed. Cir. 2006) (“The general law of evidence has long recognized that the testimony of any witness may be rendered suspect by a past relationship with a party”); *Harris v. United States*, 371 F.2d 365, 367 (9th Cir. 1967) (“A witness’s possible financial stake in the particular case is highly relevant”).

Because the Walt stock was independently admissible to show bias, even if it was not relevant under *Georgia-Pacific* (and it was), the district court did not err by allowing testimony about it. *See, e.g., United States v. Weiland*, 420 F.3d 1062, 1074 (9th Cir. 2005) (error not reversible where documents in question were “independently admissible” under different evidentiary rule); *United States v. Huang*, 87 F. App’x 656, 659 (9th Cir. 2004) (nonprecedential) (no abuse of discretion in part because co-conspirator statements were “independently admissible under the business records exception”); *cf. United States v. Loyola-Dominguez*, 125 F.3d 1315, 1318 (9th Cir. 1997) (“If a judge admits evidence that may properly be admitted, no reversible error occurs simply because the party offering the evidence fails to advise the court of the correct basis for its admission.”).

**B. The Jury’s Royalty Determination Is Supported By Extensive Independent Evidence.**

Even were this Court to conclude that the district court abused its discretion in admitting testimony regarding Dr. Walt’s stock (though it did not), any such error was harmless. The jury’s royalty determination is supported by extensive independent evidence. Illumina glosses over this evidence by asserting: “***It does not matter*** that Syntrix presented alternative reasons” to support a 6% royalty rate. Br. 46. But that is wrong: “If the district court improperly admitted the expert testimony, we apply harmless error review to determine whether its decision must be reversed.” *Estate of Barabin v. AstenJohnson, Inc.*, 740 F.3d 457, 460 (9th Cir. 2014); *see also Energy Transp. Group, Inc. v. William Demant Holding A/S*, 697 F.3d 1342, 1356-57 (Fed. Cir. 2012) (new trial not warranted where, even though plaintiff’s expert made reference to discredited rule, the expert “relied more prominently on other factors” and “further performed an entirely separate analysis of a reasonable royalty”).

Here, Mr. Ratliff presented the jury with three independent lines of evidence, apart from the Illumina-Walt agreement, that justified a 6% royalty rate: (1) the fact that Tufts was a university as opposed to commercial licensor; (2) the advanced stage of the technology in 2005 relative to 1998; and (3) the fact that Tufts originally requested a 6% royalty rate. A10873-74. Each of these is an

independent basis for a 6% rate. Thus, even if Dr. Walt's stock was not properly admitted (though it was), it was harmless.

Faced with this independent support for the jury's decision, Illumina asserts that *any* evidentiary error requires a new trial. But the cases that Illumina cites recite no such rule.

*Lucent* emphasized that the defendant did “*not* argue on appeal that any of the evidence relevant to the damages award was improperly before the jury” and that the court of appeals “accept[ed]” that all of the evidence was “properly before the jury.” 580 F.3d at 1325. In stark contrast to this case, *Lucent* held that “the evidence as presented did not reach the ‘substantial evidence’ threshold and therefore no reasonable jury could have” reached the damages award. *Id.* at 1335. Here, Illumina does not even attempt to assert that the jury’s determination is not supported by substantial evidence.

*Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292 (Fed. Cir. 2011) similarly cannot support Illumina’s claim that independent evidence for the jury’s finding “does not matter.” Br. 46. *Uniloc* held that a district court did not abuse its discretion in ordering a new trial where the only “two bases on which Uniloc’s damages case was built have both been rejected.” 632 F.3d at 1321. Those two bases were a royalty derived from “the 25% rule of thumb” that “had no relation to the facts of the case,” *id.* at 1318, and an improper comparison of the damages to

the entire \$19 billion in revenue from Microsoft Office and Windows “in clear derogation of the entire market value rule.” *Id.* at 1321. *Uniloc* does not supersede the long-established rule of harmless error, and it provides no support for a new trial here.

Finally, *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51 (Fed. Cir. 2012) does not support Illumina’s assertion that the weight of the evidence “does not matter.” Br. 46. To the contrary, *LaserDynamics* allowed a new trial where the verdict had “no support in the facts in the record,” 694 F.3d at 81, so it was impossible that any evidentiary error was harmless.

#### **IV. THE DISTRICT COURT’S WILLFULNESS JUDGMENT SHOULD BE VACATED.**

Although the jury found that all of the accused BeadChip products infringe every asserted claim of the ’682 patent, and although the jury soundly rejected all of Illumina’s invalidity defenses, the district court did not allow the jury to consider willfulness. *See* 35 U.S.C. § 284; *Bard*, 682 F.3d at 1005. Instead, before the conclusion of the evidence, the district court ruled that Syntrix could not meet the objective recklessness prong of *Seagate*’s willful infringement test. A10811. In reaching this conclusion, the district court disregarded critical evidence proving that Illumina acted recklessly, including Illumina’s use of confidential Syntrix information to copy Dr. Zebala’s invention and company name in its “*Sentrix*”

products, as well as Illumina's continued infringement even after a reexamination proceeding (initiated by Illumina) confirmed the '682 patent's validity.

The district court erred by concluding (without analysis) that Syntrix did not satisfy the objective prong of the willfulness test, where: (1) there was considerable evidence of intentional copying by Illumina, including the use of "*Sentrix*" in the name of the product that copied Syntrix's invention; (2) the Patent Office had previously rejected Illumina's anticipation defenses during reexamination; and (3) Illumina's sole remaining defenses, regarding written description and claim construction, are not reasonable.

#### **A. The District Court Disregarded Overwhelming Evidence of Illumina's Objective Recklessness.**

There was considerable evidence of Illumina's objective recklessness, all of which the district court disregarded because it incorrectly determined that it was not relevant. *See A10767* (district court concluding that it did not "see the relevance of [Syntrix's willfulness evidence] on . . . the objective prong").

*First*, Illumina "was aware of the asserted patent, but nonetheless" continued to produce and sell products that infringed the '682 patent. *i4i*, 598 F.3d at 860. Illumina became aware of Dr. Zebala's invention in January 2000, when he provided confidential material to Illumina under a nondisclosure agreement, including the actual patent application that led to the issuance of the '682 patent. A10337-40; A1894-96. After the patent issued, Syntrix provided Illumina with a

detailed claim chart demonstrating how its products infringed, A3230-36, and sought to enter into license negotiations with Illumina. A10347-48; A3228-29. Illumina was therefore at all times fully aware of Syntrix's invention and the scope of its claims, but proceeded anyway.

**Second**, Illumina copied the Syntrix invention and called the resulting product "Sentrix." *See K-TEC, Inc. v. Vita-Mix Corp.*, 696 F.3d 1364, 1378 (Fed. Cir. 2012) (objective prong met where infringer copied invention "and made only a trivial change"). Within weeks of receiving Syntrix's confidential information, Illumina filed its own provisional patent application, A2026-31, which included disclosures very similar to those Syntrix provided. A10669-71; A1761; A2027-31; A2424-25. Illumina then used the name "Sentrix" in the names of its *Sentrix* Array Matrix, *Sentrix*Scan software, and *Sentrix* BeadChip—one of the very products that incorporates the Syntrix invention disclosed in that application and claimed in the '682 patent. A10344; A10351-53; A11161; A3489; A3513; A4074-75; A4100; A4354; A5305.

**Third**, Illumina unsuccessfully tried to invalidate the '682 patent through a reexamination proceeding. A20425:4-13. The Patent Office considered two prior art references asserted by Illumina in this litigation—the Walt '540 and Lough patents—among others, and confirmed the patentability of every claim. A120-22; A10477-78; *see Safoco, Inc. v. Cameron Int'l Corp.*, No. H-05-0739, 2009 WL

2424108, at \*20 (S.D. Tex. July 31, 2009) (“[T]he *outcome* of a reexamination proceeding is . . . persuasive . . . as to whether the defendant acted ‘despite an objectively high likelihood that its actions constituted infringement of a valid patent.’” (quoting *Seagate*, 497 F.3d at 1371)). Illumina stipulated at trial that it knew the Patent Office had confirmed the validity of the ’682 patent. A11759.

The district court erroneously excluded evidence that it was Illumina that requested that *ex parte* reexamination. A10836-38. The court also excluded testimony from Illumina’s general counsel Chris Cabou confirming that Syntrix explained to him how the BeadChip products infringed the ’682 patent, *see* A10759-60, as well as evidence that Illumina failed to obtain an opinion of counsel, either before or after the reexamination, to assure itself of noninfringement. *See* A11301-02. This evidence is relevant to whether Illumina “knew of the objectively high risk of infringing” the ’682 patent. *K-TEC*, 696 F.3d at 1378. Accordingly, if the Court remands for a jury determination on the subjective prong of *Seagate*, Syntrix should be permitted to present this evidence to the jury.

**Fourth**, even after the reexamination, Illumina continued to sell the infringing products and made no effort to design around the patent or take other corrective action. *See i4i*, 598 F.3d at 860 (objective prong met where infringer failed to take “any remedial action” after becoming aware of asserted patent and

where “there is no evidence [infringer] made a good faith effort to avoid infringement”); *K-TEC*, 696 F.3d at 1378 (objective prong met where infringer failed to “adopt[] one of numerous noninfringing designs”).

At the very least, Illumina’s actions became objectively reckless after the issuance of the reexamination certificate. *Cf. Bose Corp. v. SDI Techs., Inc.*, No. 2013-1347, 2014 WL 982765, at \*8 (Fed. Cir. Mar. 14, 2014) (nonprecedential) (finding that an alleged infringer’s “good-faith belief of invalidity” to negate the requisite intent for induced infringement is judged at “several points in time”). At that time, the Patent Office confirmed that the ’682 patent was valid over the same prior art Illumina has asserted in this litigation, but Illumina “went ahead with producing, marketing, and promoting its [BeadChip products] despite an objectively high likelihood [Illumina] infringed the [’682] patent.” *i4i*, 598 F.3d at 860.

Syntrix identified all of this evidence to the district court, A10766, but the district court incorrectly concluded that it “doesn’t bear on . . . the objective prong.” A10767. That was error, because willfulness is evaluated under the “totality of the circumstances.” *Seagate*, 497 F.3d at 1369. This Court’s precedent in *K-TEC* and *i4i* establishes that the evidence presented by Syntrix was not only relevant to, but also sufficient to meet, the objective prong of *Seagate*. See *K-TEC*, 696 F.3d at 1378; *i4i*, 598 F.3d at 860. Evidence can be relevant to both the

objective and subjective prongs at the same time. *See id.* (explaining that the “same evidence” used to satisfy the objective prong can be used to satisfy “the subjective prong of *Seagate*”).

### **B. None Of Illumina’s Asserted Defenses Was Reasonable.**

If the district court had considered the evidence proving Illumina’s objectively reckless behavior, it would have found that Syntrix had met the objective prong of *Seagate* because, “in view of the facts, [Illumina’s] asserted defenses were not reasonable.” *Bard*, 682 F.3d at 1008.

**First**, Illumina’s anticipation and obviousness defenses were unreasonable.<sup>8</sup> Illumina withdrew its obviousness defense in the middle of trial. *See A11299; A11301-02.* Illumina’s anticipation defense relied on the Walt patents, which unequivocally do not disclose a “continuous porous coating of substantially uniform thickness” as required by claim 1. A112(89:43-44); *see A11668-75; A11678-79.* Illumina’s arguments were rejected by the Patent Office during reexamination and by the jury at trial. *See A120-22; A184-86; see also K-TEC, 696 F.3d at 1378* (affirming willfulness determination where defendant’s “remaining [invalidity] theories were soundly rejected by the jury”); *PharmaStem*

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<sup>8</sup> Although the district court indicated that it would decide willfulness “after hearing testimony of witnesses and observing *all* of the other evidence at trial,” A199, the district court in fact ruled before hearing any testimony on Illumina’s invalidity defenses. To the extent Illumina contends that its invalidity defenses were reasonable, those defenses could not have served as a basis for the district court’s ruling.

*Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1366 (Fed. Cir. 2007) (“When the party asserting invalidity relies on references that were considered during . . . reexamination, that party bears the added burden of overcoming the deference that is due to a qualified government agency presumed to have done its job.”) (internal quotation marks omitted). And Illumina has not even appealed the jury’s anticipation verdict.

**Second**, Illumina’s written description defense is not only wrong but unreasonable. In the district court, Illumina relied on two written description arguments that are flatly incorrect. Illumina contended that patent did not disclose *any limit* to particle size—the particles could be “as big as a watermelon,” A10159, or “the size of tennis balls [or] bowling balls.” A197. Illumina’s own expert conceded that that assertion was wrong, A11430-32, and Illumina has abandoned it on appeal. Illumina’s other (inconsistent) theory was that the patent did not disclose particles larger than 1,000 angstroms, based on selective quotation of the phrase, “too small to be useful in the present invention.” A11362. That theory unreasonably ignored the patent’s explicit disclosure of particles larger than 1,000 angstroms, *see, e.g.*, A79(24:53-54) (“[p]referably, the particles have a primary particle size of less than **2000 Å**”), and Illumina has likewise abandoned it on appeal. Illumina’s newfound argument about “classes” of particles cannot

support a lack of objective willfulness both because it finds no support in the patent and because it was never raised below.

**Third**, Illumina's claim construction argument is not only wrong but unreasonable. Illumina's theory requires adding a limitation of "multiple layers" that is *never* articulated, even once, in the claims or specification—even though the patent refers to "layers," for other purposes, more than 160 times. Illumina's sole justification for its desired limitation relies on isolating one of several purposes explicitly identified in the patent and limiting the claims to that purpose—a maneuver this Court has rejected again and again. Indeed, before this litigation, Illumina itself acknowledged that the "gelled network" term encompasses a single layer of particles, when Illumina's third-party reexamination request to the Patent Office contended that the single layer of beads described in the Seul application anticipated claim 1 of the '682 patent. *See A20359, A20361, A20402.*

Because Illumina's claim construction argument is unreasonable, Illumina did not have *any* reasonable noninfringement defense. When the district court rejected Illumina's "multiple layers" construction, Illumina disregarded the court's ruling by arguing at trial that its accused products do not infringe because they are "just one layer." A10145; *see also* A11292-96. The jury rightly rejected that argument and found in favor of Syntrix on every infringement issue (direct infringement, third party infringement, contributory infringement, and

inducement), as to every asserted claim and every accused product, *see A178-82*, and Illumina has not appealed any of those findings. *See i4i*, 598 F.3d at 860 (affirming willfulness determination where “jury heard all of [infringer’s] defenses, which it expressly rejected in finding the . . . patent infringed and not invalid”).

**C. The District Court Did Not Articulate Any Basis For Why Syntrix Failed to Meet The Objective Prong of *Seagate*.**

At minimum, the determination of no objective recklessness should be vacated because the district court did not articulate a sufficient basis for it. “Whether dealing with an issue of law like claim construction or an issue of fact such as infringement, [the Federal Circuit] must be furnished sufficient findings and reasoning to permit meaningful appellate scrutiny.” *OSRAM Sylvania, Inc. v. Am. Induction Technologies, Inc.*, 701 F.3d 698, 707 (Fed. Cir. 2012) (internal quotation marks omitted). “Where . . . the record is devoid of meaningful analysis, [the Federal Circuit] will not conduct such an analysis in the first instance.” *Id.*; *see also id.* (“It is not our role to scour the record and search for something to justify a lower court’s conclusions[.]”).

At the conclusion of Syntrix’s infringement case, the district court summarily ruled: “The Court will make the determination that the objective prong of willfulness has not been met.” A10811. The district court provided no

explanation for its decision, either orally or in writing.<sup>9</sup> At the very least, therefore, the ruling should be vacated and remanded. *Cf. OSRAM Sylvania*, 701 F.3d at 708 (reversing obviousness ruling where district court did not “explain how it reached the conclusions it does, particularly where there is evidence in the record supporting the [opposing party’s] position.”); *McGrath v. County of Nevada*, 67 F.3d 248, 256 (9th Cir. 1995) (vacating attorney’s fee award where district court “did not articulate adequately its reasons”).

## **CONCLUSION**

The judgments of infringement, no invalidity, and damages should be affirmed, and the judgment of no willfulness should be vacated and remanded for a trial on the subjective prong.

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<sup>9</sup> In the days preceding its ruling, the district court indicated that it expected to deny Syntrix’s willfulness claim as a matter of law, but never explained its basis for doing so. *See A10712; A10759; A10767-68.*

Dated: April 24, 2014

Respectfully submitted.

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## CERTIFICATE OF SERVICE

I hereby certify that on this 24th day of April, 2014, I electronically filed the foregoing Brief for Plaintiff-Cross Appellant Syntrix Biosystems, Inc. with the Clerk of the United States Court of Appeals for the Federal Circuit using the CM/ECF System, which will send notice of such filing to all registered CM/ECF users.

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## CERTIFICATE OF COMPLIANCE

Pursuant to Fed. R. App. P. 32(a)(7)(C), the undersigned hereby certifies that this brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B)(i).

1. Exclusive of the exempted portions of the brief, as provided in Fed. R. App. P. 28.1(e)(2)(B), the brief contains 16,494 words.
2. The brief has been prepared in proportionally spaced typeface using Microsoft Word 2010 in 14 point Times New Roman font. As permitted by Fed. R. App. P. 32(a)(7)(B), the undersigned has relied upon the word count feature of this word processing system in preparing this certificate.

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